Supreme Court, U.S.
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No.
85-1095

IN THE
SUPREME COURT OF THE UNITED STATES
OF AMERICA

October Term 1985

NORMAN O. AAMODT and MAJORIE M. AAMODT

vs.

UNITED STATES NUCLEAR REGULATORY COMMISSION, NUNZIO J. PALLADINO, CHAIRMAN, and UNITED STATES OF AMERICA,
Respondents

METROPOLITAN EDISON CO., JERSEY CENTRAL POWER & LIGHT CO., PENNA. ELECTRIC CO., and GPU NUCLEAR CORP.,
Intervenors

On Writ of Certiorari to The United States Court of Appeals for the Third Circuit (Appeal Nos. 85-3301, 85-3302, 85-3310, 85-3315)

APPENDIX

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UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

No. 85-3302

COMMONWEALTH OF PENNSYLVANIA,
Petitioner,

vs.

UNITED STATES NUCLEAR REGULATORY COMMISSION, and NUNZIO J. PALLADINO, CHAIRMAN,
Respondents.

PRESENT: SEITZ, ADAMS and STAPLETON, Circuit Judges.

ORDER

The Court having considered the petitioner's motion for a stay pending determination on the merits and the opposition thereto by respondents, United States Nuclear Regulatory Commission and General Public Utilities and having given consideration to the protracted history and present posture of this matter as well

as the pervasive nature of the public interest involved, and having concluded that a sufficient showing has been made by petitioner to warrant a stay pending an expedited review of the merits of the petition for review, it is

ORDERED that the motion for stay is granted until further order of the court, and it is

FURTHER ORDERED that petitioner's brief shall be filed on or before June 17, 1985 and the briefs for all respondents shall be filed on or before June 24, 1985, and it is

FURTHER ORDERED that oral argument on the merits will be held commencing at 10:00 a.m. on Thursday, June 27, 1985. The total amount of argument time allocated to all petitioners in Nos. 85-3301, 85-3310, 85-3302, 85-3315 shall be 40 minutes which they may divide as they see fit. The total amount of

argument time for all respondents in the above numbered cases shall be 40 minutes which they may divide as they see fit. In view of the consolidation order a joint brief shall be filed by all petitioners unless, on application, the court otherwise orders. Respondents, other than the Commission, shall also file a joint brief unless, on application the court otherwise orders. The Commission may file a separate brief.

By the Court,

_____

Circuit Judge

Dated: June 7, 1985

UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

Nos. 85-3301, 85-3302, 83-3310, 85-3315

THREE MILE ISLAND ALERT, INC., et al.
Petitioner, No. 85-3301

COMMONWEALTH OF PENNSYLVANIA,
Petitioner, 85-3302

UNION OF CONCERNED SCIENTISTS,
Petitioner, 85-3310

NORMAN A. AAMODT and MARJORIE M. AAMODT,
Petitioner, 85-3315

vs.

UNITED STATES NUCLEAR REGULATORY COMMISSION, NUNZIO J. PALLADINO, CHAIRMAN, and UNITED STATES OF AMERICA.

Respondents

METROPOLITAN EDISON CO., JERSEY CENTRAL POWER & LIGHT CO., PENNA. ELECTRIC CO., and GPU NUCLEAR CORP.,

Intervenors

(NRC No. 50-289 SP)

ON APPEAL FROM THE UNITED STATES NUCLEAR REGULATORY COMMISSION

PRESENT: SEITZ, ADAMS and STAPLETON, Circuit Judges

This cause came to be heard on the record from the United States Nuclear Regulatory Commission and was argued by counsel June 27, 1985.

On consideration whereof, it is now here ordered an adjudged by this Court that the petition for review of the decision and order of the said Commission entered May 29, 1985, be, and the same is hereby and the order affirmed. Costs taxed against petitioners. All of the above in accordance with the opinion of this Court.

ATTEST:

Clerk

Date: August 27, 1985

UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

NOS. 85-3301, 85-3302, 85-3310, 85-3315

THREE MILE ISLAND ALERT, INC., et al.,
Petitioner, No. 85-3301

COMMONWEALTH OF PENNSYLVANIA,
Petitioner, No. 85-3302

UNION OF CONCERNED SCIENTISTS,
Petitioner, No. 85-3310

NORMAN O. AAMODT and MARJORIE M. AAMODT,
Petitioners, No. 85-3315

vs.

UNITED STATES NUCLEAR REGULATORY
COMMISSION, NUNZIO J. PALLADINO,
CHAIRMAN, and UNITED STATES
OF AMERICA,

Respondents

METROPOLITAN EDISON CO., JERSEY
CENTRAL POWER & LIGHT CO.,
PENNA. ELECTRIC CO.,
and GPU NUCLEAR CORP.,

Intervenors

APPEAL FROM THE UNITED STATES
NUCLEAR REGULATORY COMMISSION

(Docket No. 50-289 SP)

Argued: June 27, 1985

Before: SEITZ, ADAMS, and STAPLETON,
Circuit Judges

(Opinion Filed: August 27, 1985)

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OPINION OF THE COURT

STAPLETON, *Circuit Judge*.

Three Mile Island Nuclear Station has two units, TMI-1 and TMI-2[1]. On March 28, 1979, an accident severely damaged TMI-2. Prior to the accident, TMI-1 had been shut down for normal refueling and maintenance. On July 2, 1979, the Nuclear Regulatory Commission ("NRC") issued an immediately effective

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1. TMI-1 and TMI-2 are jointly owned by Metropolitan Edison Company, Jersey Central Power & Light Company, and Pennsylvania Electric Company. Metropolitan Edison Company was the NRC-licensed operator of TMI-1 and TMI-2 until January 1982. Since then, GPU Nuclear Corporation has been the licensed operator of both units. All of these companies are wholly-owned subsidiaries of General Public Utilities Corporation.

order requiring that TMI-1 remain shut down until the Commission, after a public hearing, determined that there was reasonable assurance that the licensee could restart and operate the unit without endangering the health and safety of the public. 44 Fed. Reg. 40,461 (July 10, 1979). On August 9, 1979, the NRC issued a further order specifying the procedural and substantive format for the hearing. *Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit No. 1), CLI-79-8, 10 NRC 141 (1979).

The petitioners in this review proceeding are the Commonwealth of Pennsylvania (the "Commonwealth"), Three Mile Island Alert, Inc. ("TMIA"), the Union of Concerned Scientists ("UCS"), and Norman and Marjorie Aamodt (the "Aamodts"). These petitioners intervened before the Commission and participated actively and effectively in the extensive hearings conducted pursuant to the August 9, 1979 order. While the issues addressed in these hearings remained under advisement at various levels of the administrative process, several motions were filed asking that the hearing record be reopened. While the record was reopened to receive some additional evidence, the Commission denied motions of these petitioners.

On May 29, 1985, the Commission decided that TMI-1 could be safely restarted under certain stipulated conditions and ordered that the 1979 immediately effective suspension of the TMI-1 operating license be lifted. Petitioners insist that the Commission could not legally take this action without holding an adjudicatory hearing on the issues raised in their motions to reopen the administrative record. Some of the petitioners also contend that the decision reflected in the Commission's May 29th Order is arbitrary and capricious. We conclude that the May

29th Order is not arbitrary, capricious, or contrary to law and that, accordingly, the petitions for review should be denied.

I. SUMMARY OF THE PROCEEDING

The proceeding that gives rise to these petitions for review is one of the most comprehensive adjudicatory proceedings ever conducted by the NRC. The procedural history of this matter is described in detail by the Commission in its May 29, 1985 order, CLI-85-9, 21 NRC ___, and will not be repeated here in full. Nevertheless, a summary of that complex history is a prerequisite to an understanding of the issues raised by petitioners.

The Commission's August 9, 1979 "Order and Notice of Hearing" ("Order") called for an adjudicatory hearing to commence within 180 days of publication of the Order and established a Licensing Board, consisting of one lawyer and two scientists,[2] to conduct the hearing. CLI-79-8, 44 Fed. Reg. 47821, 10 NRC 141 (1979). The proceedings conducted pursuant to the Order are hereafter referred to as the "Restart Proceedings." The purpose of the hearing was to determine "whether any further operation [of TMI-1 would] . . . be permitted and, if so, under what conditions." 10 NRC at 142. The Commission directed the Licensing Board to answer two questions:

> (1) Whether the "short term actions" recommended by the Director of Nuclear Reactor Regulation ... are necessary and sufficient to provide reasonable assurance that the Three Mile Island Unit 1 facility can be operated without endangering the health

2. The original Licensing Board members were Ivan W. Smith, Esquire, Chairman, Dr. Walter H. Jordan, and Dr. Linda W. Little. 10 NRC at 146-7.

> and safety of the public, and should be required before resumption of operation should be permitted.
>
> (2) Whether the "long-term actions" recommended by the Director of Nuclear Reactor Regulation ... are necessary and sufficient to provide reasonable assurance that the facility can be operated for the long term without endangering the health and safety of the public, and should be required of the licensee as soon as practicable.

10 NRC at 148.

The Order required the licensee, Metropolitan Edison Company ("Met Ed"), to maintain TMI-1 in a "cold shutdown condition" until (1) satisfaction of such short-term actions as the Commission ultimately determined, "after review of the Licensing Board's decision, to be necessary and sufficient to provide adequate protection of the public health and safety" and (2) reasonable progress toward the long-term actions that the Commission determined to be necessary and sufficient to satisfy the same standard. 10 NRC at 146. The NRC also requested the Director of its staff to determine outside of the adjudicatory proceeding whether the short-term conditions ultimately imposed had been satisfactorily completed. Restart was prohibited until the Director certified to the Commission that all such conditions had been met.

The Commission intended the capability and integrity of the licensee's operating and managerial personnel (the "management competence" issues) to be important issues in the restart proceedings. Among the "short-term" actions proposed by the Director and subject to adjudication before the Licensing Board were that the licensee, with respect to TMI-1:

> Augment the retraining of all Reactor Operators and Senior Reactor Operators assigned to the control room including training in the areas of natural circulation and small break loss of coolant accidents including revised procedures and the TMI-2 accident. All operators will also receive training at the B&W simulator on the TMI-2 accident and the licensee will conduct a 100 percent reexamination of all operators in these areas. NRC will administer complete examinations to all licensed personnel in accordance with 10 CFR 55.20-23..
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> • • •
>
> The licensee shall demonstrate his managerial capability and resources to operate Unit 1 while maintaining Unit 2 in a safe configuration and carrying out planned decontamination and/or restoration activities. Issues to be addressed include the adequacy of groups providing safety review and operational advice, the management and technical capability and training of operations staff, the adequacy of the operational Quality Assurance program and the facility procedures, and the capability of important support organizations such as Health Physics and Plant Maintenance.

10 NRC at 144-45.

Before the hearing commenced, the Commission entered a supplementary order, CLI-80-5, 11 NRC 408 (March 6, 1980), which gave the Licensing Board further guidance regarding the management competence issues:

> In determining whether Metropolitan Edison is capable of operating Unit 1 safely, the Board is directed to examine the following broad issues: (1)

whether Metropolitan Edison's management is sufficiently staffed, has sufficient resources and is appropriately organized to operate Unit 1 safely; (2) whether facts revealed by the accident at Three Mile Island Unit 2 present questions concerning management competence which must be resolved before Metropolitan Edison can be found competent to operate Unit 1 safely; and (3) whether Metropolitan Edison is capable of operating Unit 1 safely while simultaneously conducting the clean-up operation at Unit 2.

In the course of examining these broad questions, the Licensing Board should examine the following specific issues:

(1) whether Metropolitan Edison's command and administrative structure, at both the plant and corporate levels, is appropriately organized to assure safe operation of Unit 1;

(2) whether the operations and technical staff of Unit (sic) is qualified to operate Unit 1 safely (the adequacy of the facility's maintenance program should be among the matters considered by the Board);

(3) What (sic) are the views of the NRC inspectors regarding the quality of the management of TMI Unit 1 and the corporate management, staffing, organization and resources of Metropolitan Edison;

* * *

(7) whether Metropolitan Edison has made adequate provision for groups of qualified individuals to provide safety review of and operational advice regarding Unit 1;

(8) what, if any, conclusions regarding Metropolitan Edison's ability to operate Unit 1 safely can be drawn from a comparison of the number and type of past infractions of NRC regulations attributable to the Three Mile Island Units with industry-wide infraction statistics;

(9) what, if any, conclusions regarding Metropolitan Edison's ability to operate Unit 1 safely can be drawn from a comparison of the number and type of past Licensee Event Reports ("LER") and the licensee's operating experience at the Three Mile Island Units with industry-wide statistics on LER's (sic) and operating experience;

(10) whether the actions of Metropolitan Edison's corporate or plant management (or any part or individual member thereof) in connection with the accident at Unit 2 reveal deficiencies in the corporate or plant management that must be corrected before Unit 1 can be operated safely. . . .

CLI-80-5, 11 NRC 408, 409 (1980).

The August 9, 1979 Order required the Licensing Board to render decisions on these issues and to certify the record to the Commission for final decision.[3] The Order further provided for an unusual two-track review of the Licensing Board's decision.[4] In addition to

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3. The Commission originally planned to conduct the appellate review of the Licensing Board's decision itself. However, the complexity of the proceedings led the Commission to establish an Atomic Safety and Licensing Appeal Board ("Appeal Board") to hear initial appeals. CLI-81-19, 14 NRC 304 (1981).

4. Ordinarily, a licensee is given the opportunity to challenge an NRC enforcement action before the action takes effect. Because the

appellate review of Licensing Board decisions by the Commission, the Order created an "effectiveness review" to determine whether to lift the immediate effectiveness of the shutdown orders and to permit operation of the plant prior to completion of the appellate review.

The Licensing Board thereafter conducted formal hearings that in their detail and complexity far exceeded the Commission's original expectations. Whereas the Commission anticipated that the hearings would take 60 days and that the Licensing Board would render its decision eleven months after the August, 1979 Order, the Licensing Board ultimately held 155 days of hearings and, six years after the TMI-1 shutdown orders, has yet to issue the final installment of its decision.

The comprehensiveness of the NRC proceeding can be measured in part by the enormity of its record. The administrative record currently consists of more than 100,000 pages, including approximately 33,000 transcribed pages of testimony and argument and thousands of additional pages of exhibits and written testimony. The Licensing and Appeal Boards and the Commission have published opinions filling 1,500 pages in the NRC's official reports. The Commission itself has heard oral presentations from the parties on five different occasions, has held a meeting in Harrisburg, Pennsylvania, to hear from members of the public, and has issued more than 26 substantive orders.

Commission determined that protection of public health and safety required issuance of immediately effective shutdown orders for TMI-1, it did not give Metropolitan Edison this opportunity. Therefore, the Commission provided for restart, prior to final appellate review of Licensing Board decisions, once the reasons for making the order immediately effective were adequately resolved. CLI-79-8, 10 NRC 141, 149 (1979).

At the hearings themselves, all parties had the opportunity to cross-examine witnesses and offer rebuttal evidence. The Licensing Board conducted an extensive inquiry regarding the management competence issues. The licensee produced its management and technical personnel at the hearing, and petitioners and other intervenors, as well as the Board, examined them at length. LBP-81-32, 14 NRC 381, 401 (August 27, 1981). Moreover, at a supplementary hearing before a Special Master on allegations that TMI-1 plant operators had cheated on tests, the operators testified under a sequestration order and were thoroughly examined. LBP-82-56, 16 NRC 281, 291 (July 27, 1982).

The Licensing Board has issued four partial initial decisions, each of which--after imposing certain conditions on restart--concludes that TMI-1 may be restarted. In its first decision, issued August 27, 1981, the Board addressed several management-related issues, including licensee's management structure, the adequacy of licensee's training program, licensee's response to the accident at TMI-2, and licensee's capability and resources. LBP-81-32, 14 NRC 381 (1981). The Board concluded that the Director's recommendations governing management competence were necessary and sufficient to ensure public safety, but retained jurisdiction to consider the effect on its decision of an ongoing investigation of allegations of operator cheating on licensing exams.[5] The Board noted that because it lacked sufficient information, it had not considered in its decision the subject matter of a United States Department of Justice criminal investigation of alleged falsification by TMI-2 operators

5. Shortly before the Licensing Board issued its first partial decision, the NRC staff notified the Board that it was investigating allegations of cheating by licensee's senior reactor operators on NRC operator license exams.

of safety-related leak rate tests. On October 2, 1981, the Board reopened the record on the implications of the alleged operator cheating and appointed a Special Master to hear the relevant evidence.

The Licensing Board issued its second initial decision on December 14, 1981, covering hardware and design issues, the separation of Units 1 and 2,[6] and emergency planning. LBP-81-59, 14 NRC 1211 (1981). Again, the Board found that the licensee satisfied NRC short-term requirements, subject to correction of several deficiencies in design, procedures and planning. These corrections, "in the form of Licensee commitments, NRC Staff requirements and Board-imposed conditions," provided reasonable assurance that TMI-1 could be operated without endangering the health and safety of the public. 14 NRC at 1711. The Board also determined that licensee had made reasonable progress toward the Director's recommended long-term actions.

Before the Licensing Board issued its next partial initial decision, licensee undertook a reorganization that resulted in Met Ed being replaced by GPU Nuclear Corporation ("GPUN") as the operator of TMI-1. GPUN was a newly-created subsidiary of General Public Utilities Corporation ("GPU") whose sole responsibility is management of GPU's three nuclear power plants.[7]

The Board's third partial initial decision, issued on July 27, 1982, addressed the allegations of cheating in response to which it had reopened the record the previous October. LBP-82-56, 16 NRC 281 (1982). This decision reviewed the Special Master's report, which

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6. The Commission's Order of August 9 directed the Licensing Board to determine whether TMI-1 may be safely operated while TMI-2 was being decontaminated. 10 NRC at 145.

7. *See supra* footnote 1. Besides managing TMI-1 and TMI-2, GPUN operates the Oyster Creek nuclear facility.

had been submitted on April 28, 1982, LBP-82-34B, 15 NRC 918 (1982), imposed five new conditions on the restart of TMI-1, and concluded that the favorable determinations of the first and second partial initial decisions remained in effect. 16 NRC at 385.

After the Licensing Board rendered its third partial initial decision, litigation between GPU and Babcock & Wilcox Co., the manufacturer of the TMI-2 reactor, produced information that petitioners believe highly relevant to the management competency issues. That information, according to petitioners, indicates that the licensee made false statements to the NRC in its response to a Commission Notice of Violation for misconduct related to the TMI-2 accident. On April 18, 1983, the NRC staff announced it was "revalidating" its earlier position on management competence.[8]

Soon thereafter, GPUN committed to make three significant organizational changes. On June 10, 1983, it announced it would realign personnel to minimize involvement at TMI-1 of employees who had preaccident involvement at TMI-2, add full-time, on-shift operational quality assurance coverage by degreed engineers, and realign functions within the office of the president of GPUN.

On August 31, 1983, the Appeal Board decided to reopen the record for further hearings on the impact of the leak rate falsification charges on management competence. ALAB-738, 18 NRC 177 (1983). The Commission, in an October 7, 1983 unpublished order, took review of the Appeal Board's determination and stayed any hearings into the matter.

The Commission heard oral presentations from all parties on November 28 and December 5 regarding the

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8. After conducting an investigation, the staff once again endorsed management's competence in July, 1984. NUREG-0680, Supp. No. 5 (July, 1984).

reorganization of the licensee. At the November hearing, GPU announced further changes in its oganization. Besides verifying that the June 10th plan had been implemented, the company announced that three outside directors had been added to the GPUN Board of Directors, and that they would comprise a separately staffed and funded Nuclear Safety and Compliance Committee. GPU also announced that the President of GPUN, Robert Arnold, had resigned. On February 6, 1984, GPU announced further personnel changes, including one affecting Herman Dieckamp, who, while continuing to serve as GPU's President, would no longer serve as Chairman and Chief Executive Officer of GPUN.[9]

The cumulative effect of personnel changes at TMI-1 since the TMI-2 accident was to significantly alter the GPUN workforce. Of the twelve senior GPUN officers, eight joined the GPU system after the TMI-2 accident, and three of the remaining four had no connection with Met Ed. Of 435 key personnel at GPUN, 235 joined GPUN after the accident, and 100 preaccident employees had never worked with Met Ed. The number of full-time employees who are to work at TMI-1 is almost triple the number employed when Met Ed operated it (915 to 315). Finally, GPUN employs nearly eight times as many employees responsible for training as did Met Ed (55 to 7). CLI-85-09, 21 NRC ___, ___ n.39 (1985).

On February 28, 1984, Met Ed pled guilty to criminal falsification of leak rate data. A Statement of Facts submitted to the Court by the United States Attorney in connection with the sentencing specified that although "the evidence would establish that a number of employees of the Metropolitan Edison Company engaged in the criminal activities charged in

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9. Dieckamp remained on the GPUN Board of Directors.

the indictment," "the evidence presented to the grand jury and developed by the United States Attorney does not indicate that any" of the directors or officers of GPUN from its inception in 1982 "participated in, directed, condoned, or was aware of the acts or omissions that are the subject of the indictment.

On May 24, 1984, the Appeal Board reversed the Licensing Board's third partial initial decision and reopened the record on three issues. ALAB-772, 19 NRC 1193 (1984). These were the effect of the cheating incidents on training, the truthfulness of a mailgram sent by GPU President Herman Dieckamp to Congressman Morris Udall shortly after the accident, and the possibility of improper leak rate practices at TMI-1. 19 NRC at 1279-80.

The Commission on February 25, 1985, reversed the Appeal Board's decision to reopen the record: CLI-85-2, 21 NRC 282 (1985). After considering the numerous contentions raised by the parties, the Commission found that none of those contentions warranted further hearings in the restart proceeding. The Commission in particular addressed the petitioners' claim that leak rate falsifications at TMI-2 raised sufficient doubts regarding management competence as to require reopening of the record. It concluded that personnel changes by the licensee mooted the immediate significance of the TMI-2 leak rate manipulation and, to provide added assurance, imposed the following conditions on the licensee:

(1) No pre-accident TMI-2 operator, shift supervisor, shift foreman, or any other individual both in the operating crew and on shift for training as a licensed operator at TMI-2 prior to the accident shall be employed at TMI-1 in a responsible management or operational position without specific Commission approval.

"Operational position" as used here includes any position involving actual operation of the plant, the direction or supervision of operators, or independent oversight of operations.

This condition shall also apply to the pre-accident Vice President, Generation, TMI-2 Station Manager, TMI-2 Supervisor of Technical Support (from January 1977 to November 1978), TMI-2 Supervisor of Technical Support (from December 1978 to the accident), and TMI-2 Supervisor of Operations. This condition shall not apply to Michael Ross, and Brian Mehler may continue in his present position consistent with this condition.

(2) Licensee, in the absence of Commission authorization to the contrary, is to retain its expanded Board of Directors and its Nuclear Safety and Compliance Committee.

21 NRC at 341-2.

The Commission's February 25th order also initiated a new proceeding to consider disciplining employees, other than those explicitly cleared by the United States Attorney in his Statement of Facts, possibly involved in leak rate falsification at TMI-2.[10] 21 NRC at 287. Finally, the Commission directed the Licensing Board to issue decisions on the training and Dieckamp mailgram issues, on which the Board already had completed evidentiary hearings.

The Licensing Board issued its fourth partial initial decision on May 3, 1985, LBP-85-15, 21 NRC ___

10. The Commission also exempted from the proceeding employees already exonerated by the NRC's Office of Investigations, which earlier had investigated allegations of leak rate falsification at TMI-1. 21 NRC at 287.

(1985). This decision reviewed the adequacy of licensee's training programs in light of the cheating incidents. The Board, after requiring the licensee to implement a plan for on-the-job performance evaluation, once again found in favor of restart.

On May 9, 1985, the Director of the NRC certified that the licensee had satisfied all of the 155 conditions that had been imposed during the Restart Proceedings, and on May 29, 1985, the Commission, after first reiterating its conclusion that personnel and procedural changes at TMI-1 had rendered the allegations raised by petitioners moot for the purposes of determining when and under what conditions restart could safely occur, lifted the immediate effectiveness of the orders requiring the shutdown of TMI-1. CLI-85-09, 21 NRC ___ (1985).

II. THE SCOPE OF REVIEW

Pursuant to 5 U.S.C. § 706(2)(A), the standard of review of the Commission's order of May 29, 1985, is deferential: that order may not be overturned unless it is found to be "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law."

With respect to petitioners' procedural arguments, this Court has noted that the NRC regulatory scheme is "virtually unique in the degree to which broad responsibility is reposed in the administering agency, free of close prescription in its charter as to how it shall proceed in achieving the statutory objectives." *Westinghouse Electric Corp. v. Nuclear Regulatory Commission*, 598 F.2d 759, 771 (3d Cir. 1979), *quoting Siegel v. Atomic Energy Commission*, 400 F.2d 778, 783 (D.C. Cir. 1968). *See also San Luis Obispo Mothers for Peace v. Nuclear Regulatory Commission*, 751 F.2d 1287, 1294 (D.C. Cir. 1984); *Carstens v. Nuclear Regulatory Commission*, 742 F.2d

1546, 1551 (D.C.Cir. 1984). A narrow standard is particularly appropriate in reviewing petitioners' central challenge, an attack on the Commission's refusal to reopen the record of the Restart Proceedings to hear further evidence on certain issues. As the United States Court of Appeals for the District of Columbia recently held, "[w]here as here the agency has taken final action on a matter that is peculiarly within its realm of expertise, we will not require the agency to reopen its proceedings except upon a clear showing of abuse of discretion or of extraordinary circumstances." *San Luis Obispo, supra*, at 1317-18, *quoting Mobil Oil Corp. v. Interstate Commerce Commission*, 685 F.2d 624, 632 (D.C. Cir. 1982).

With regard to the claim raised by petitioners Aamodts that the TMI-2 accident caused greater amounts of radiation to be released than the NRC believes, deference must be accorded to the Commission's expertise. "When examining this kind of scientific determination, as opposed to simple findings of fact, a reviewing court must generally be at its most deferential." *Baltimore Gas & Electric Co. v. Natural Resources Defense Council, Inc.*, 462 U.S. 87, 103 (1983).

Our "limited, albeit important, task" is to review "agency action to determine whether the agency conformed with controlling statutes." *Id.* at 97. In undertaking this task, we must be mindful both of the Congressional policy choice favoring the development of nuclear power and of the Congressional mandate that the Commission be charged with the responsibility of protecting the public health and safety while overseeing the activities of the nuclear power industry. Our words in *Westinghouse Electric Corp. v. Nuclear Regulatory Commission* are equally appropriate here:

> Congress has delegated authority in the delicate area of nuclear energy to a number of agencies, among them the NRC. The NRC is charged with the responsibility of protecting the common defense and security as well as the public health and safety, while overseeing the licensing of nuclear facilities. Some of the decisions it makes to further its statutory mandate may be unpopular in the nuclear industry, among environmentalists, or with other groups of citizens. But Congress has decreed that the agency be independent from outside control, and it would subvert this design were we to invalidate the challenged NRC action when it appears to be consonant with statutory dictates and not an unreasonable exercise of its discretion.

Westinghouse Electric Corp., supra, 598 F.2d at 779.

III. CONSISTENCY OF THE PROCEEDINGS WITH § 189(a) OF THE ATOMIC ENERGY ACT

The Restart Proceedings resulted in 155 conditions being imposed on the licensee to ensure that TMI-1 could be operated consistent with public health and safety. Petitioners argue that the procedures followed by the NRC in this case, which led to imposition of these conditions, violate Section 189(a) of the Atomic Energy Act, 42 U.S.C. § 2239(a) (1976) (amended by Pub. L. No. 97-415, § 12, 96 Stat. 2067, 2073 (1983)). Section 189(a) provides:

> (1) In any proceeding under this chapter, for the granting, suspending, revoking, or amending of any license or construction permit, or application to transfer control, and in any proceeding for the issuance or modification of rules and regulations dealing with the activities of

> licensees . . . the Commission shall grant a hearing upon the request of any person whose interest may be affected by the proceeding, and shall admit any such person as a party to such proceeding. . . .

The petitioners insist that the Restart Proceeding is a proceeding for the amending of a license within the meaning of Section 189(a) and that they are persons whose interest stands to be affected by that proceeding. The NRC maintains that the Restart Proceeding is an enforcement proceeding rather than a proceeding for amending a license, that petitioners are not persons whose interests could be affected by the addition of more restrictive safety conditions, and that, in any event, the Commission has voluntarily accorded the petitioners all the procedural protection to which they would have been entitled if Section 189(a) were applicable.

Under 10 CFR § 2.200-.206 (1985), the Commission is authorized to institute enforcement proceedings "to impose requirements by order, or to modify, suspend, or revoke a license, or to take other action as may be proper." 10 CFR § 2.200 (1985).[11] When such a proceeding is instituted, the licensee ordinarily continues to operate during the pendency of the proceeding pursuant to its outstanding authority. In some circumstances, however, the Commission may determine that the "public health, safety, or interest" requires "that the proposed action be temporarily effective pending further order" of the Commission. 10 CFR § 2.202(f) (1985). The effect of these regulations is to provide the Commission with the authority, where issues of public health and safety are involved, to determine whether or not a licensee will be permitted

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11. Unless otherwise noted, the cited regulations remain unchanged since 1979.

to continue to operate during an enforcement proceeding and, if so, under what conditions. In this case, the Commission decided to immediately shut down TMI-1 until public hearings on conditions of operation were held.

As noted above, the August 9, 1979 Order spelled out a dual review procedure. It designated the appellate review for resolution of the ultimate issues in the enforcement proceeding and the immediate effectiveness review for resolution of the issues of whether, when and under what conditions the "immediate effectiveness" of the July 2, 1979 shutdown order would be lifted. Although the Commission's May 29, 1985 resolution of the "immediate effectiveness" issues came later in the proceedings than originally contemplated, it did not terminate those proceedings. The Commission's May 29, 1985 Order is thus a determination relating solely to whether the licensee will be able to utilize its *existing authority* during the pendency of an ongoing Commission proceeding.

This procedural context is important. While amendments to the TMI-1 operating license may, and probably will, be imposed before the end of the current proceeding, the May 29, 1985 Order does not purport to impose such amendments. The sole effect of that Order is to lift the 1979 shutdown orders: the licensee has no greater operating authority by virtue of the May 29, 1985 Order than it had on July 1, 1979. It is true that the Commission, as a condition of lifting its shutdown order, has imposed numerous restrictions on the way in which the licensee may exercise its existing authority, but petitioners have pointed us to nothing in this record which indicates that the Commission has purported to effect amendments to the license or that license amendments are necessary to permit the licensee to operate in accordance with the

restrictions which have been imposed.[12] The imposition of conditions on the lifting of the stay and thus on the licensee's interim operations does not establish that the Commission has purported to amend the outstanding license since the Commission's regulations contemplate that such restrictions may be imposed during the course of a proceeding to determine whether or not license amendments or other actions are appropriate.[13]

Because the May 29, 1985 Order does not purport to effect a license amendment, the proceeding before us does not present the primary procedural issue which petitioners seek to litigate -- whether the Commission must comply with Section 189(a) of the Atomic Energy Act before amending a license in an enforcement proceeding. Accordingly, we express no opinion on that issue. We hold only that Section 189(a) is not implicated when the Commission enters an order lifting a suspension so that a licensee may operate

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12. We are not called upon to determine, and we do not determine, whether, in fact, the immediate restart of TMI-1 with the conditions imposed by the Commission would be incompatible with the requirement that the facility operate "in accordance with" its existing operating license. 42 U.S.C. § 2131.

13. We are mindful that the Commission claims the authority to effect license amendments during an enforcement proceeding upon a finding that the public health and safety require that such amendments become immediately effective. Nothing suggests to us that it has exercised that authority in this case. Under 42 USC § 2131, it is unlawful for anyone to use a "production facility except under and in accordance with a license issued by the Commission." For obvious reasons, it is important that the parameters of a licensee's operating authority be clear and unambiguous. We think it highly unlikely that the Commission would attempt to amend a license without expressly stating its intention to do so and without setting forth the amendment *in haec verba*. It seemed apparent at oral argument that the issue of which "conditions" of the lifting of the shutdown order would become license amendments had not as yet been addressed.

under existing authority during the course of an enforcement proceeding.[14]

IV. CONSISTENCY OF THE PROCEEDINGS WITH THE ORDER OF AUGUST 9, 1979.

Petitioners contend that the May 29, 1985 decision lifting the immediate effectiveness of the shutdown orders is inconsistent with the procedural rules established by the Commission in its August 9, 1979 Order. They argue that the 1979 Order precluded the Commission from basing the restart decision on evidence other than that contained in the adjudicatory record developed by the Licensing Board, and that the Commission violated this stipulation by relying on extra-record material to support its May 29th decision. UCS also contends that the 1979 Order precluded the Commission from authorizing restart in the absence of prior favorable determinations by the Licensing and Appeal Boards, and that the Appeal Board's remand on the three management integrity issues indicates that such favorable determinations are lacking. We discuss each of these arguments in turn.

Extra-Record Material

We agree with the petitioners that the August 9, 1979 order contemplated immediate effectiveness review by the Commission based on the adjudicatory record developed by the Licensing Board. We assume,

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14. Petitioners also argue that the Administrative Procedure Act (APA) requires that they be afforded full hearing rights on all material issues in the Restart Proceedings, and that the Commission's decision be based on the adjudicatory record. The APA specifies the procedure to be followed "in every case of adjudication *required by statute* to be determined on the record after opportunity for an agency hearing." 5 U.S.C. § 554 (emphasis added). Petitioners' claim to APA rights consequently depends on the applicability of § 189(a) to this case. Since we do not reach the question of § 189(a)'s applicability, we also have no comment on the merits of petitioners' APA arguments.

without deciding, that this irrevocably committed the Commission to make its effectiveness decision on the basis of that record. Moreover, while the May 29th decision is based upon that adjudicatory record, we agree with petitioners that it rests in part on extra-record facts. However, given that these extra-record facts are undisputed and that petitioners were afforded a fair opportunity to offer both argument and evidence on all of the relevant issues in the Restart Proceeding, we conclude that the Commission's reliance on extra-record materials in its May 29th decision does not require further Commission proceedings.

While the Commission declares in its decision that it is relying solely on the "formal adjudication record," CLI-85-09, 21 NRC at ___, this is not the case. In addition to evidence developed before the Licensing Board, the Commission gave significant weight to facts concerning the reorganization of the licensee which were not developed before that Board. Petitioners do not assert that these extra-record facts are untrue. They argue, however, that because of the continuing presence at GPU of three individuals who were employed by it prior to the TMI-2 accident, the personnel changes are not as significant as the Commission suggests. The three employees to whom they refer are William Kuhns, Chairman and Chief Executive Officer of GPU, Herman Dieckamp, President of GPU, and Michael Ross, TMI-1 Manager of Plant Operations. Petitioners suggest that the Commission cannot in fairness rely upon these personnel changes without affording them an additional public hearing at which they will have the opportunity to introduce additional evidence relevant to the integrity of Messrs. Kuhns, Dieckamp, and Ross.

We find this suggestion unpersuasive in light of the fact that the effect of the undisputed facts relied on by the Commission, and the complementary condition

insulating TMI-1 operations from virtually all personnel connected with TMI-2 prior to the accident, was *to narrow* the relevant issues remaining before the Commission and not to raise new ones. Put another way, during the 155 days of hearings, petitioners were well aware that they faced the prospect of having Ross, Kuhns, and Dieckamp associated with the licensee upon restart. They had ample opportunity to cross-examine these men and offer evidence concerning their past. Mr. Ross, for example, appeared before the Licensing Board five times over several days and testified on a broad variety of issues. LBP-81-32, 14 N.R.C. 381, 439 (1981).

While petitioners now feel they have more cross-examination and rebuttal material than they had at the time of the hearing, that is not an uncommon occurrence in adjudicative proceedings, and whether that ammunition may be used is a question to be decided, as it was, in a proceeding on a motion to reopen the record. We conclude that the Commission, having afforded petitioners the opportunity to offer evidence regarding Kuhns, Ross and Dieckamp, could rely upon the undisputed personnel changes without reopening the record on the integrity of these men.

The Need for Prior Favorable Board Determinations

UCS argues that the Commission could not authorize restart of TMI-1 until the Licensing Board and the Appeal Board had first reached favorable determinations on the adequacy of the proposed short-term actions, including those related to management integrity. The Licensing Board's positive assessment of management competence, UCS points out, was rendered without hearings on the leak rate falsifications at TMI-2 and was made specifically "subject to this matter." LBP-81-32, 14 NRC 381, 557 (1981). Moreover, UCS stresses that the Appeal Board,

when deciding to reopen the record to pursue the leak rate test issue, determined that it should not assess management competence without that evidence. ALAB-738, 18 NRC 177, 190 (1983).

We may assume for present purposes that the August 9, 1979 Order conditioned restart on a prior favorable determination by the Licensing Board, for UCS's argument fails on its own terms. The record indicates that the Licensing Board has in fact issued a favorable determination on management integrity. Although the Appeal Board believed that further hearings were desirable, the Appeal Board's decision to reopen the record was reversed by the Commission. We find nothing in the August 9 Order to indicate that the Commission surrendered its right to make the ultimate determination on whether and when to reopen the record. Because the Commission's reversal of the Appeal Board leaves standing the initial favorable Licensing Board determination, even under the UCS analysis the Commission could lawfully authorize restart.[15]

V. REFUSAL TO REOPEN THE RECORD

As we have noted, the parties extensively litigated the management competence issues before the Licensing Board closed the hearing record and issued its August 27, 1981 decision favorable to the licensee. LBP-81-32, 14 NRC 381 (1981). After the record closed,

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15. The August 9, 1979 Order expressly contemplated a Commission decision on whether to lift the shutdown orders *prior* to completion of the appellate review process. CLI-79-8, 10 NRC 141, 149 (1979). The Appeal Board, after its creation, was powerless to lift the stay. Rather, the Commission was "the exclusive administrative body with the power to determine whether Unit One may restart during the pendency of any possible appeals of a Board decision before the" Appeal Board. CLI-81-34, 14 NRC 1097, 1098 (Dec. 23, 1981).

however, there were several potentially significant developments. The most important of these was Met Ed's guilty plea to federal criminal charges of leak rate falsification at TMI-2. Petitioners moved to reopen the record on management competence, and the Appeal Board granted their motions on four issues. ALAB-738, 18 NRC 177 (1983); ALAB-772, 19 NRC 1193 (1984). After receiving briefs from the parties, the Commission decided, on February 25, 1985, that the hearing record need not be reopened prior to restart: CLI-85-2, 21 NRC 282 (1985). Petitioners insist that the Commission's refusal to hold hearings on post-record developments renders the May 29, 1985 decision arbitrary and capricious.

In refusing to reopen the record, the Commission engaged in its traditional tripartite inquiry for determining if new evidence is of sufficient importance to outweigh the general policy against permitting reopenings. The Commission asked:

> (1) Is the motion timely; (2) does it address significant safety . . . issues; and (3) might a different result have been reached had the newly proffered material been considered initially.

21 NRC at 285, n.3. This test has been judicially sanctioned, *San Luis Obispo Mothers for Peace v N.R.C.*, 751 F.2d 1287, 1316-18 (D.C. Cir. 1984).

At the outset, we reject petitioners' contention that the Commission cannot rely on extra-record material in assessing the significance of evidence submitted in support of a motion to reopen the record. "Newly proffered material" is by definition extra-record. Because it is also "new" by definition, in the vast majority of cases, limiting the Commission's consideration of a motion to reopen to data already in the record would require that the moving party's allegations be accepted at face value. We think such a

rule arbitrary and unworkable. If the Commission has, or can obtain through investigation, information bearing on the subject matter of a motion to reopen, we conclude that it should be free to use that information in deciding that motion. Here, for example, the Commission, confronted with a motion that heavily stresses Met Ed's guilty plea, should not be required, as petitioners would suggest, to ignore the fact that the same investigation that led to that plea also produced information indicating GPUN's management personnel had been unaware of the criminal activity.

Our resolution of this issue is of considerable importance in this case, for although the several issues raised by petitioners are extra-record in the sense that they do not appear in the Licensing Board's formal adjudicatory record, they have been carefully examined by NRC staff investigators. In particular, the Commission heavily relied on NUREG-0680, Supp. No. 5, a staff report that reviews the investigations conducted by the NRC Office of Investigation ("OI") and reaches results favorable to current management on the issues raised by petitioners, including leak rate falsification at TMI-1 and TMI-2.

We now proceed to consider whether the Commission abused its discretion in refusing to reopen the record for each issue raised by petitioners. Although we discuss each issue individually, we have considered the cumulative effect of all of the information available to the Commission, as did it, and our conclusion that the Commission did not abuse its discretion has been reached in that context.

TMI-2 Leak Rate Falsification

By far the most important of the reopening issues is whether the record on management competence should be reopened for hearings on the pre-accident falsification of leak rate data by TMI-2 operators in

violation of NRC regulations.[16] Harold Hartman, a TMI-2 control room operator prior to the accident, alleged that plant operators, with the knowledge of shift supervisors, had falsified tests that measured whether primary system leakage surpassed technical specifications in the TMI-2 license. In April, 1980 the NRC referred the matter to the Department of Justice for criminal investigation. This investigation culminated in the February 28, 1984 guilty plea of Met Ed.

Although we recognize the importance of the issue, we are unable to say that the Commission acted arbitrarily or capriciously in refusing to reopen the record on the leak rate tests. It is undisputable that leak rate falsification had been a serious problem at TMI-2 prior to the accident and further investigation of that problem was clearly called for. The issue was whether to pursue that potentially lengthy process in a new proceeding or whether to reopen the proceeding that had already resulted in TMI-1 being closed down for five and a half years. If the leak rate issue was safety significant to the current operation of TMI-1, the additional delay and attendant expense would, of course, be justified. If that issue was not safety significant to the current operation of TMI-1, further

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16. Strictly speaking this issue is not "new." Allegations of leak rate data manipulation were made by a TMI-2 operator, Harold Hartman, as early as May 22, 1979. In fact the "Hartman allegations" received New York television coverage in March, 1980. Nevertheless, because the NRC did not actively pursue the matter and may have at least implicitly discouraged petitioners from doing so, in light of the ongoing criminal investigation, *see* ALAB-738, 18 N.R.C. 177, 188 (1983), the Commission did not rest its decision on the timeliness of the motions to reopen. The fact that petitioners may not have been guilty of laches in failing to earlier press the Hartman allegations, however, does not mean that their motions to reopen the record should be tested by a lower standard than if they were asking for consideration of newly discovered evidence.

delay and expense would be difficult to justify. In this context, the Commission framed the issues for decision as follows:

> To determine whether the Hartman allegations still raise a significant safety issue, the Commission must first consider whether the personnel likely responsible for the falsifications under Met. Ed. are now in responsible management positions at GPU Nuclear or directly associated with the operation of TMI-1. If the personnel are still the same, then there is merit to the argument that there has been a change only in name, not in substance, and the integrity concerns raised by the Hartman allegations remain significant. However, if the persons likely responsible for or involved in the TMI-2 leak rate falsifications are not assigned to responsible management or operational positions at TMI-1, then the Hartman allegations no longer raise concerns about the integrity of those who will operate TMI-1. In that event, however, the Commission further should consider whether the new personnel, organizational structure, and procedures provide reasonable assurance that similar procedural violations will not recur.

21 NRC at 297.

The Commission concluded that no one assigned to a responsible management or operational position at TMI-1 was responsible in any way for leak rate falsification at TMI-2 and that new personnel, organizational structure and procedures provided reasonable assurance that similar violations would not recur.

The Commission, as a result of the lengthy proceedings before it and the investigation of its staff, was intimately familiar with the events leading up to

the accident at TMI-2, with the operating and managerial personnel of the licensee prior to the accident and with the operating and managerial personnel of the licensee prepared to restart TMI-1. The Commission was also intimately familiar with the extensive changes in everything from hardware to training which had been effected at TMI-1 after the accident and with the 153 conditions that had already been imposed. In addition, the Commission was aware that the investigation which had uncovered the leak rate falsification problem had indicated that current GPUN management personnel were unaware of that activity and that current operating and supervisory personnel at TMI-1, with one possible exception, had had no connection with pre-accident TMI-2. Finally, the Commission realized that it could assure a continuing absence of taint in the operating personnel at TMI-1 simply by imposing an additional condition, and it did so. Under these circumstances, we conclude that the Commission could reasonably find, as it did, that altered conditions rendered the fact of TMI-2 leak rate falsifications no longer safety significant to TMI-1's operation.

Petitioners' argument that the Commission acted arbitrarily or capriciously necessarily focuses on the three individuals who will have some responsibility with respect to TMI-1 who also had some pre-accident involvement with TMI-2: Michael Ross, William Kuhns, and Herman Dieckamp.[17] The Commission recognized this fact and set forth the reasons it believed the continued presence of these men did not detract from

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17. A fourth employee associated with TMI-2 is Brian Mehler, now manager of the TMI-1 Radwaste Department. The Commission noted that Mehler no longer has direct involvement with the operation of the TMI-1 reactor, 21 NRC at 298-99, and no petitioner seriously challenges the safety significance of his continued presence.

the assurance provided by the changed conditions at TMI-1.

Michael Ross, as current Manager of Operations at TMI-1, is the only one of the three to hold a safety significant "operational position" at the plant. 21 NRC at 298. Because of the position he would hold, as earlier noted, Ross was one of the focal points of the hearings and extensive findings were made about his competence, including his integrity in the context of alleged operator cheating on tests. Nevertheless, in response to petitioners' motion to reopen, the OI, at the Commission's direction, conducted an investigation to determine whether Ross had in any way participated in or condoned leak rate manipulation. As the Commission noted, the "evidence developed by OI showed that Ross' role at TMI-2 was minimal, that during the period falsifications took place he was present at TMI-2 only the minimum time necessary to maintain his Unit 2 license, and that he was not involved in the falsifications." 21 NRC at 298-9. The Commission, accordingly, determined that Ross posed no risk to the safe operation of TMI-1. The only additional information which petitioners advance in support of their position is that Ross has a reputation for being a "stickler for details." Petitioners infer from this that, despite his minimal contact with TMI-2, Ross must have known that leak rate manipulation was going on there. While this is perhaps a permissible inference, it is not a necessary one, particularly in light of the other information about Ross available to the Commission. Accordingly, we are unable to find that the Commission acted arbitrarily in concluding that the continued presence of Ross at TMI-1 did not require the Commission to reopen the record on TMI-2 leak rate falsifications.

The Commission considered as well the safety significance of the continued presence of Messrs.

Kuhns and Dieckamp at GPU. Kuhns has been Chairman of GPU during all relevant periods. Dieckamp remains a member of the Board of GPUN, as well as President, Chief Operating Officer, and a Director of GPU. The Commission found it highly unlikely that corporate officers of their rank would have been aware of the details of normal plant operation such as leak rate testing, and also concluded that Kuhns and Dieckamp were not responsible for the attitude at TMI-2 that permitted the falsifications to occur. 21 NRC at 301. The Commission also relied on the exculpatory statement offered by the United States Attorney in connection with the sentencing hearing of Met Ed:

> [T]he evidence presented to the Grand Jury and developed by the United States Attorney does not indicate that any of the following persons participated in, directed, condoned or was aware of the acts or omissions that are the subject of this indictment. And they are Williams G. Kuhns, Herman M. Dieckamp . . . .

Transcript of Proceedings, Change of Plea and Sentencing, *United States v. Metropolitan Edison Co.*, Crim. No. 83-00188, at 16 (M.D. Pa. Feb. 28-29, 1984). We believe the Commission could reasonably rely on this statement in determining that the presence of Kuhns and Dieckamp at TMI-2 did not make the leak rate falsifications at TMI-2 safety significant to TMI-1 operations.

In summary, the Commission made a policy decision between holding hearings on the TMI-2 pre-accident, leak rate manipulation problem in the TMI-1 restart proceeding or in a separate proceeding. It chose the latter course because it concluded that changed personnel and altered procedures at TMI-1 rendered the pre-accident experience at TMI-2

irrelevant to an assessment of the safety of TMI-1 operations. In making this choice, the Commission analyzed the relevant issues relying on information from reliable sources, reasoned to a logical conclusion, and articulated the reasons for its decision. As a reviewing court, we can ask nothing more of the Commission.

TMI-1 Leak Rate Test Practices

Petitioners allege that leak rate falsifications also occurred at TMI-1, and that the Commission erred in refusing to reopen the record for hearings on this issue. These allegations arise from the results of an NRC staff review of TMI-1 leak rate tests for the period April 1, 1978 to March 31, 1979. This review, which found 38 of 645 tests had been improperly conducted, led to an investigation by the OI. After the OI reported, the Appeal Board decided to reopen the record for hearings on TMI-1 leak rate data. ALAB-772, 19 NRC 1193 (1984).

The Commission, in reversing the Appeal Board, again relied on the OI investigation. This investigation included sworn interviews of *all* pre-accident and current TMI-1 employees who conducted the leak rate tests during the period in question. 21 NRC at 311. The Commission distinguished the leak rate falsifications at TMI-2 from the leak rate "irregularities" at TMI-1 because only three of the 38 questionable tests, if properly conducted, would have indicated excessive leakage. There was therefore no need to falsify test results. *Id.* Based upon the OI investigation, the Commission concluded that the intervenors had an unrealistic perspective on the significance of the available data:

> The OI investigation revealed that leak rate testing was considered a ministerial monitoring

> duty at TMI-1 prior to the accident. It was not difficult to obtain an acceptable leak rate test, and most operators relied on other plant parameters to determine actual leakage. Hence little significance was given to leak rate testing practices. Under these circumstances, it is not surprising that some irregularities in the data may appear. There is no evidence of falsification beyond speculative inferences that could be drawn solely from the circumstance of a few irregularities in the data and some superficial similarity between leak rate practices at TMI-2 and TMI-1. The Commission finds the circumstantial evidence indicating there might have been a few improper leak rate tests conducted in 1978-79 does not raise a significant safety concern that might have changed the Licensing Board's decision.

Id. at 312 (footnotes omitted).

The Commission also specifically addressed and rejected the possibility that Michael Ross knew of the leak rate irregularities. *Id* at 313. The Commission concluded that, given the thoroughness of the OI investigation, there was no reason to believe that further hearings would produce sigificant new information on leak rate test irregularities at TMI-1. *Id.* at 311.

We agree with UCS that the fact that TMI-1 operators did not need to falsify test results does not exculpate them if they in fact did so on occasion. But we understand the Commission to mean that the lack of motivation to falsify is some evidence that the leak rate irregularities uncovered by the staff review do not reflect a safety-significant pattern of falsification.

While the decision on whether to reopen the record for a hearing on TMI-1 leak rate testing was one about which reasonable minds could differ, as did the

Commission and the Appeal Board, this does not make the Commission's decision arbitrary or capricious. Once again, it responsibly addressed the relevant issues and drew permissible conclusions from all of the data available to it.

Response to the 1979 Notice of Violation (NOV) and Changes in the Keaten Report

The Commission also refused to reopen the record for rehearings on the accuracy of GPU's response to the NRC's October, 1979 NOV, which proposed fining the licensee for procedural violations related to the TMI-2 accident. After the accident, GPU created an internal task force, headed by R.W. Keaten, to investigate the accident. Upper management personnel read and revised drafts of the Keaten Report at the same time that licensee submitted its NOV response. After the Keaten Report was completed, the OI interviewed more than 25 people to determine whether GPU management improperly revised the report. In addition, review of the Keaten Report raised the question of whether licensee knowingly made inaccurate statements in its NOV response. The NRC staff reviewed the OI investigation and concluded that the NOV response contained statements "neither accurate nor complete and . . . contrary to other information in the possession of the licensee." NUREG-0680, Supp. No. 5 at 8-19. Finally, the staff placed responsibility for the inaccuracies on two officers, one E. Wallace, and the then President of licensee, R. C. Arnold, both of whom no longer are associated with TMI-1, and on Dieckamp, "who reviewed the response before it was submitted and chose 'not to intervene.'" 21 NRC at 330, quoting NUREG-0680, Supp. No. 5 at 8-21.

The Commission, conceding that some changes to the Keaten Report seemed clearly designed to improve

licensee's image, nevertheless did not believe that the changes raised "integrity concerns" that warranted further hearings in the absence of "a showing that false information was used negligently or intentionally." 21 NRC at 333. Here, the only false factual information the Commission found was that which was also included in the NOV response. It concerned the role played by a relief valve in the TMI-2 accident. The source of the false information was Wallace. Since it was not unreasonable for other officers to rely on Wallace under the circumstances, the Commission found the issue no longer safety significant. Furthermore, the Commission decided that because the Licensing Board had not relied on GPU testimony in any event, further information on GPU's view of the accident would not be likely to change the Board's initial favorable determination.

The Commission also decided that questions concerning GPU's response to the NOV did not justify reopening the record. The Commission reiterated the fact that the two persons most culpable for the inaccuracies in the response--Wallace and Arnold--were no longer associated with TMI-1. Dieckamp thus formed the only link between the falsehood in the NOV response and the issue of current management integrity. Dieckamp had found the argument in the NOV response "kind of thin" but had chosen not to intervene. *Id.* at 334. The Commission characterized his behavior as "unwise," but did not believe it raised a significant safety concern. *Id.* We cannot say that the Commission acted arbitrarily or capriciously in reaching these determinations.

Aamodts' Radiation Release Study

Petitioners Norman and Marjorie Aamodt contend that the restart order was arbitrary and capricious because the Commission failed to reopen the record to

consider further evidence concerning the health effects of the TMI-2 accident. The Aamodts first petitioned the Commission on June 21, 1984 for an investigation into the possibility that 1979 radiation releases were greater than reported by the licensee. Their petition included an empirical study, conducted by the Aamodts, of the health effects of the accident in three areas they believed fell in the pathway of radiation plumes released by TMI-2. This study purportedly documented flora abnormalities, an excessive number of cancer cases, and immediate post-accident physical responses symptomatic of radiation sickness.

The Commission requested and received a study of the Aamodts' methodology by the Center for Disease Control ("CDC"), upon which it then relied, in a December 13, 1984 decision, to reject the request for further investigation. CLI-84-22, 20 NRC 1573 (1984). The Commission noted several problems with the Aamodts' evidence. First, their conclusion flew in the face of the conclusions of numerous past radiation analyses. In addition, CDC's analysis of the empirical evidence found that the Aamodts' method of interview was unsystematic and subject to interviewer bias, that the Aamodts had failed to compare their findings to a control group, that the number of cancer deaths cited by the Aamodts was unverified, that in any event those cancer deaths had not been causally linked to the TMI-2 accident, and that the medically-accepted latency period from radiation exposure to cancer diagnosis was too long for cancer cases attributable to the TMI-2 accident to have surfaced. The Commission therefore held that the Aamodts had failed to present sufficient reliable information to discredit earlier, comprehensive, and scientific surveys of radiation releases from TMI-2. Finally, the Commission noted the existence of ongoing research into the health effects of the accident being conducted by the

Pennsylvania Department of Health and promised to respond appropriately if this research produced any indication of high cancer risks to the surrounding population.

The Aamodts next moved for reconsideration and for reopening of the formal hearing record to receive the health information that they had compiled. They claimed to have verified the number, geographical placement, and medical cause of the cancer-related deaths described in their original motion. The Aamodts argued that the studies relied upon by the Commission in its December 13 decision fail to account for the fact that much of the data compiled in the first fifteen hours of the accident at TMI-2 are missing or for the possibility that radiation escaped, unmeasured by TMI-2 instruments, through "unmonitored release pathways." The Aamodts also submitted their response to the CDC critique.

The Commission denied both motions on May 16, 1985. CLI-85-08, 21 NRC ___, (1985). Applying the three factor test for reopening the record, the Commission found the motion untimely, not significant to safety, and unlikely to change previous results. In holding that the new evidence was not safety significant, the Commission continued to credit earlier studies over the Aamodts', primarily because of problems in the time of diagnosis, assumed latency period, and population size in the Aamodts' study. The Commission described the Aamodts' evidence as "fragmentary and anecdotal" and insufficient "to support a reasonable doubt as to the adequacy and correctness of the several detailed scientifically conducted studies on which the Commission relied." 21 NRC at ___.

We do not find that the Commission's refusal to reopen the record was arbitrary or capricious. The

Commission found serious methodological flaws in the Aamodts' study and it was not required to adopt their views regarding the statistical significance of the cancer cases they discovered or of the latency period between exposure to radiation and the occurrence of cancer. As for the propriety of the Commission relying on earlier studies of the health effects of the TMI-2 accident, we believe this is the kind of scientific determination over which "a reviewing Court must generally be at its most deferential." *Baltimore Gas & Electric Co. v. Natural Resources Defense Council, Inc.*, 462 US 87, 97 (1983).

Other Refusals to Reopen

Finally, the Commission refused to reopen the record on various other issues including changes in the so-called Lucien Report, a change in operator testimony at the Babcock and Wilcox trial, the allegedly untimely reporting of two consultant reports, and the alleged harassment of cleanup workers at TMI-2. In its fifty-seven page opinion of February 25, 1985, the Commission addresses these issues in turn, setting forth the information available with respect to each, explaining the positions of the intervenors, and analyzing each in light of the three-prong test for determining when a record will be reopened. 21 NRC 282, 325-9, 335-42. No purpose would be served by our repeating that which is there published. Suffice it to say that the Commission's decisions to pursue these matters only through staff investigation and not in a reopened adjudicatory hearing were permissible products of reasoned analysis.

VI. EMERGENCY PLANS

The Aamodts further contend that the NRC has failed adequately to respond to two other issues raised

by them, to wit, that volunteer workers may not be relied upon to fulfill their evacuation-related responsibilities in the event of another accident at TMI, and that the Commonwealth's emergency plan for farmers and their livestock is inadequate.

The Licensing Board held extensive hearings on emergency planning and, in particular, heard evidence concerning the reliability of volunteers. It directly addressed the issue in its second partial initial decision. LBP-81-59, 14 NRC 1211, 1486-89 (1981). The Board found "no evidence which contravenes the finding that there is reasonable assurance that in the event of a nuclear emergency at TMI there will be an adequate number of emergency workers who will stay and perform their jobs." 14 NRC at 1489. We do not understand the Aamodts to contend that the Licensing Board's decision finds no support in the record; rather their contention is that the Board was mistaken. As we have stressed earlier, however, our function is not to "second guess" the Commission's resolution of the relevant issues.

With regard to the Commonwealth's emergency plan for farmers and their livestock, the parties also extensively litigated this issue before the Licensing Board. 14 NRC 1211, 1671-80. The Board explicitly approved of the plan in its second partial initial decision. 14 NRC at 1677. The Appeal Board reached the same conclusion. ALAB-697, 16 NRC 1265, 1280 (October 22, 1982). Contrary to the Aamodts' assertions, the Appeal Board did not order revisions of the plan that the Commonwealth has failed to effect. Rather, the Board found that the Commonwealth's emergency plan goes "beyond the regulatory requirements and devotes considerable attention to the special needs of farmers." *id* at 1275. The Appeal Board did, in fact, "strongly recommend" that

"protective information specific to farmers be developed and distributed." *id* at 1279, but it also clearly specified that its suggestions were not "a condition for restart." *Id* at 1280. We find no abuse of discretion in either of these decisions.

VII. DISQUALIFICATION OF THE LICENSING BOARD CHAIRMAN

Finally, TMIA contends that the Licensing Board Chairman, Judge Ivan Smith, prejudged the issues before him and demonstrated pervasive bias in favor of licensee, thereby depriving TMIA of its right to a fair hearing. The Commission refused to disqualify Judge Smith upon the motions of TMIA, the Commonwealth, and UCS. CLI-85-05, 21 NRC 566, April 5, 1985). Only TMIA presses this argument before us.

The standards governing recusal of NRC Licensing Board members are the same as those for the federal judiciary. *Houston Lighting and Power Co. (South Texas Project, Units 1 and 2)*, CLI-82-9, 15 NRC 1363, 1365 (1982). A judge must disqualify himself if he ". . . has a personal bias or prejudice either against [a party] or in favor of any adverse party," 28 U.S.C. § 144. "The alleged bias and prejudice to be disqualifying must stem from an extrajudicial source and result in an opinion on the merits on some basis other than what the judge learned from his participation in the case." *United States v. Grinnell Corp.*, 384 U.S. 563, 583 (1966). A rarely invoked exception to the extrajudicial source rule requires recusal when a judge displays "pervasive bias," regardless of the source of the bias. *Houston Lighting and Power Co.* at 1366. Finally, a judge must also disqualify himself if ". . . his impartiality might reasonably be questioned." 28 U.S.C. § 455(a). This test calls for recusal "where a reasonable man knowing all the circumstances would

harbor doubts concerning the judge's impartiality." *United States v. Dalfonso*, 707 F.2d 757, 760 (3d Cir. 1983).

TMIA points to several examples of allegedly biased courtroom behavior on the part of Judge Smith. We have reviewed each of the designated episodes. In context, they simply do not support the petitioners' claim of personal bias in favor of GPU.

Of more substance is TMIA's contention that a letter, written by Judge Smith to District Court Judge Sylvia Rambo, both represented prejudgment of the issues before the Licensing Board and stemmed from extrajudicial sources. This letter urged Judge Rambo to be lenient in her sentencing of a TMI-2 operator convicted of cheating on licensing tests. Although we believe Judge Smith exercised poor judgment in writing this letter, we do not find that, taken alone or in conjunction with the other TMIA examples of bias, the letter requires disqualification of Judge Smith. Judge Smith's letter provided three reasons for leniency, only one of which arguably raises a question of prejudgment of the merits in the Restart Proceedings. The letter stated:

> [A] severe criminal penalty . . . is in my personal view, not needed to insure the integrity of the NRC operators' licensing process at Three Mile Island. . . . Many weeks of public NRC hearings have been devoted to the issues of TMI management integrity and operator competence and, in fact, hearings on that very issue are still in progress. I have confidence that the NRC administrative regulatory process, with extensive public participation, will provide an orderly and reliable mechanism for assuring that any problems caused by deception respecting Three Mile Island will have been identified and resolved. Deception in the future is very unlikely.

Although this argument may be said to express confidence in the NRC rather than bias in favor of GPU, it appears to express confidence that the NRC will develop procedures that the Licensing Board will find "necessary and sufficient" to protect the public health and safety. This is, of course, closely related to what the Commission, in its August 9, 1979 Order, directed the Board to determine, with one important difference. Judge Smith did not indicate whether specific training-related actions would be sufficient to support restart. Rather, he stated that the NRC, with public participation, would eventually develop a "mechanism" for preventing future deception. Thus, Judge Smith did not prejudge the necessity or sufficiency of any of the short- or long-term actions that the Commission charged the Licensing Board to evaluate. He simply indicated his belief that any future deception would not go undetected.

We find no fault with the Commission's refusal to disqualify Judge Smith.

CONCLUSION

The 1979 accident at Three Mile Island presented the NRC with a substantial and difficult problem concerning the continued operation of the undamaged reactor, TMI-1. The Commission ordered that the reactor remain in a shutdown condition pending investigation and an adjudicatory hearing in which interested representatives of the public could participate. As the investigation and the hearing progressed, it became increasingly apparent that there had been serious deficiencies in the licensee's performance at TMI-2. This fact made the Commission's task of resolving the TMI-1 restart issues considerably more involved and resulted in the Restart Proceedings being significantly more comprehensive than originally anticipated. The

procedures chosen by the Commission well served their intended purpose, however, and a wide variety of issues, including the competence of the licensee's management, were aired and resolved. The intervenors played an active and constructive role in those proceedings. With their help, 155 conditions were fashioned that the Commission has determined provide adequate assurance that TMI-1 can be operated by the licensee with safety.

Petitioners are not satisfied with the Commission's process or with the results of its deliberations primarily because, after the hearing, they learned, or first focused upon, certain information that they deem relevant to the management competence issues. While they were permitted to bring this information before the Commission and secured a staff investigation concerning it, they were unsuccessful in their efforts to reopen the adjudicatory hearing. They feel strongly about the issues raised in their motions to reopen and their desire for further hearings is understandable. At some point, however, proceedings must terminate in outcomes. The Commission determined that this point has been reached with respect to the issue of lifting the 1979 shutdown orders, and we conclude that this determination is neither arbitrary nor capricious.

When Congress enacted the Atomic Energy Act, it was aware that risk assessment and policy choices would be an inherent part of the development of atomic energy. It assigned the responsibility for making such assessments and choices to the NRC. Insofar as the issues presented by these petitions for review are concerned, the NRC has exercised its authority reasonably and in accordance with law. Accordingly, we will deny the petitions for review.

ADAMS, *Circuit Judge*, dissenting.

The extent of public concern surrounding the Three Mile Island nuclear plant is matched only by the gravity of the accident that occurred there on March 28, 1979, an accident widely acknowledged as the worst in the history of commercial nuclear power in the United States. Deep anxiety has been expressed by the Pennsylvania residents who live in the reactor's shadow, as well as by citizens throughout the nation. It is in this setting that we are asked to determine whether the Nuclear Regulatory Commission ("Commission" or "NRC") properly refused to hold further hearings on issues of management integrity arising out of actions taken by the licensee prior to, during, and after the accident. Because I believe that in a case of this consequence full public disclosure of serious charges of management misconduct is required, I respectfully dissent.

The primary ground for my disagreement with the majority is that the Commission has failed to provide a statutorily mandated hearing on charges that operators at TMI-2, with full knowledge and authorization of supervisory personnel, systematically falsified leak rate data in order to avoid shutting down the facility. All parties to the original NRC hearings were aware of the leak rate falsification allegations, and recognized their materiality to the issue of management integrity, a central subject of the hearings. The NRC Staff, however, discouraged the parties from pursuing the matter because of a pending criminal investigation. In effect, hearings on this issue were postponed by the Licensing Board, which issued a favorable determination on management integrity, but reserved judgment on the leak rate falsification issue. The criminal investigation eventually led to an indictment and conviction of Metropolitan Edison, the

licensee,[1] for manipulating leak rate data in violation of safety regulations. Despite this criminal conviction, the Commission determined that leak rate falsification no longer needed to be addressed in public hearings. The Commission thus transformed a postponement into a cancellation, and deprived petitioners of their statutory right to a public hearing on the most serious charges of licensee misconduct to emerge since the accident. See 42 U.S.C. § 2239(a)(1982)(hereinafter §189(a)).

I.

It should be noted preliminarily that I am not the first to suggest that public hearings are necessary to develop significant issues left unresolved by the 1981 hearings. Many Pennsylvania public officials have consistently urged further public hearings.[2] These

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1. At the time of the TMI-2 accident, Metropolitan Edison was one of three subsidiary utilities under General Public Utilities (GPU). After the accident, Metropolitan Edison was merged with a technical and administrative support company under GPU, the name was changed to GPU Nuclear, and the licensee's responsibilities were expanded to encompass another nuclear reactor at Oyster Creek. The change in nomenclature thus does not alter corporate identity, and the hearings into management integrity simply substituted GPU Nuclear for Metropolitan Edison. *See* LBP-81-32, 14 NRC 381, 403-07 (1981).

   Despite the addition of many new personnel and the transfer of others, many high level personnel at the time of the accident remain in positions of authority in GPU or GPU Nuclear. They include: GPU Board Chairman William Kuhns, GPU President Herman Dieckamp, GPU Nuclear President Philip Clark, GPU Nuclear Vice President for Nuclear Assurance Robert Long, GPU Nuclear Vice Presidents Richard Howard, Richard Wilson, and Henry Hukill, GPU Nuclear Director of Engineering Projects Robert Keaten, and TMI-1 Manager of Operations Michael Ross.

2. Interested parties pressing for further public hearings include: the Governor of and both United States Senators from Pennsylvania, the state in which the plant is situated; the

elected officials speak for their constituents when they petition for a complete public airing of management competence issues, and prompt public action to remedy any inadequacies of the licensee, before restart of the nuclear reactor that has caused unprecedented fear in their state. The Commission, however, appears to find this public concern so lacking in significance that it declined to consider leak rate manipulation and other serious charges of management misconduct in open hearings.[3]

Public controversy may very well surround nuclear power issues for years to come, but this is precisely why public hearings are so important, and have been mandated by Congress. Where the elected representatives of the people most immediately affected

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Mayor and President of the City Council of Harrisburg, the nearest major city to the reactor; and various commissioners and presidents of neighboring counties and townships. See Brief Amicus Curiae of Pennsylvania Elected Officials.

3. Even within the NRC there are signs of uncertainty regarding several issues of management integrity that have not yet been subject to hearings. Thus, the Licensing Board, which conducts hearings in the first instance, issued its decision on management integrity "subject to" the results of the ongoing criminal investigation at TMI-2. The Appeal Board, which reviews Licensing Board determinations, twice ordered the Licensing Board to conduct further hearings on management integrity issues, including leak rate falsification. Even the NRC Staff, which participates as a party in the adjudicatory proceedings and has consistently advocated restart, admitted that had it known at the time of the 1981 hearings information regarding licensee misconduct that was available by 1984, it likely would have reversed its favorable recommendation. Finally, when the Commission overruled the Appeal Board, concluding that no further hearings were required before restart on any management integrity issues, the vote was 3-2 over strong dissents from Commissioners Asselstine and Bernthal. Where so much disagreement exists even within the Nuclear Regulatory Commission itself, it suggests that unresolved issues appropriate for public hearings remain.

ask that matters as serious as a criminal conviction of the licensee be investigated in an open, public hearing, considerable caution should be employed before the issue is allowed to be adjudicated behind closed doors.

II.

The majority concludes that because in its view restart of TMI-1 does not constitute a license amendment, there is no statutorily prescribed right to a hearing on management integrity issues. It further holds that the Commission did not abuse its discretion in refusing to reopen the record for further hearings on new evidence of management misconduct. I respectfully disagree with both determinations. First, the leak rate falsification issue is, by the Commission's own definition, material to a license amendment decision, and therefore may not be decided without a mandatory hearing. Second, I conclude that the Commission abused its discretion in refusing to reopen the record with respect to the Keaten Report, a document prepared by the licensee and reviewed by several of its high-level officials, which was altered to conform to the licensee's inaccurate response to an NRC inquiry about the accident.

It is important to make clear that two different standards govern this case. Where the Commission defines an issue as material to a license amendment proceeding, §189(a) applies, and "parties need only show that their 'interests may be affected'" in order to receive a hearing on that issue. *San Luis Obispo Mothers for Peace v. Nuclear Regulatory Comm'n*, 751 F.2d 1287, 1316 (D.C. Cir. 1984); *Union of Concerned Scientists v. United States Nuclear Regulatory Comm'n*, 735 F.2d 1437 (D.C. Cir. 1984). The duty to provide a § 189(a) hearing on issues material to a license amendment decision is mandatory; on review, therefore, we are not overseeing an exercise of discretion, but enforcing a ministerial duty. If the

Commission resolves such an issue without a public hearing, its action is reversible as "not in accordance with" the statutory dictates of § 189(a).

A different standard applies where a hearing has been completed, the record has been closed, and parties seek to have it reopened for consideration of new evidence. Because there is an interest in finality, and because new evidence will almost inevitably arise where, as here, there is a considerable time lapse between the close of hearings and issuance of a Commission order, the standard for reopening "imposes a substantially more onerous burden on parties." *San Luis Obispo Mothers for Peace*, 751 F.2d at 1316. In order to obtain reopening for consideration of new evidence, petitioners must show that their new evidence is (1) timely; (2) material, in the sense that it would have resulted in a different outcome had it been known earlier; and (3) safety-significant. *Id.* Where the Commission exercises its discretion and refuses to reopen a closed record to consider new evidence, it is appropriate to reverse only where we conclude that the Commission has abused its discretion. *San Luis Obispo Mothers for Peace*, 735 F.2d at 1317-18.

Petitioners contend that because the Commission defined management integrity as a material issue to a license amendment determination, all matters pertaining to integrity require resolution by a § 189(a) hearing. The majority concludes that the restart order is not a license amendment, despite admissions to the contrary from the Commission itself as well as the licensee.[4] The majority therefore determines that no issues are governed by § 189(a), and applies the "new

4. The Commission admits that it "amended the license and allowed restart." NRC Brief at 68 n.51, while the licensee concedes that "as a result of the Licensing Board, Appeal Board and Commission orders in this proceeding, license amendments will be imposed on GPU Nuclear." Met Ed Brief at 55.

evidence" reopening standard to all issues. I would steer a middle course. I would find, as petitioners claim and respondents admit, that the restart order does constitute a license amendment, but I would hold that only the leak rate falsification issue still merits a § 189(a) hearing. This is because the record on leak rate falsification was never closed: the issue was known to be material at the time of the initial hearings, but was intentionally not covered at those hearings because of an ongoing criminal investigation, and was expressly reserved by the Licensing Board's otherwise favorable determination regarding management integrity.

With the exception of the leak rate issue, however, the hearings on management integrity have been conducted and closed. Thus, petitioners must meet the more stringent reopening standard in order to obtain hearings on the new evidence that they raise, because they have already received the § 189(a) hearing to which they are entitled on the broad issue of management integrity. Nevertheless, I believe that on one of these matters -- the Keaten Report -- the Commission did abuse its discretion in refusing to reopen the record.

III.

As the majority notes, the Commission's treatment of allegations of pre-accident leak rate falsification at TMI-2 constitutes "by far the most important" of the issues to be addressed on appeal. Leak rate tests measure leakage from the reactor coolant system. They are to be conducted every 72 hours, and where they indicate leakage in excess of one gallon per minute (gpm), the reactor must be placed on "Hot Standby" for six hours and "Cold Shutdown" for the next thirty hours. Harold Hartman, a control room operator at TMI-2, alleged that for several months prior to the March 1979 TMI-2 accident it was difficult to obtain leak rate data under the one gpm threshold, yet the

facility was never put on standby or shutdown. Hartman explained that instead he and other control room operators, with the knowledge of supervising management, customarily repeated the leakage tests until they obtained a good rate (by covertly adding water or hydrogen to the testing system) and threw out bad test results.[5] *See generally* ALAB-738, 18 NRC 177, 185-186 (1983).

The widespread nature of leak rate falsification was brought to light by Hartman in a May 1979 interview with the NRC Staff and in a deposition several months later. It was not until Hartman made his allegations publicly, however, in a television program in March 1980, that the NRC and the licensee began to investigate his charges. The NRC Staff halted its investigation after just one month, when the Department of Justice (DOJ) undertook its own investigation.[6] The DOJ inquiry led to a criminal indictment resolved by a plea agreement: Metropolitan Edison, the licensee, was convicted of manipulation of

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5. In a Notice of Violation issued October 25, 1979, the NRC Staff found that unidentified leakage at TMI-2 remained above one gpm from March 22, 1979 until March 28, 1979, the date of the accident, and that the plant should have been in "Cold Shutdown" during all of that period. Thus, leak rate falsification contributed directly to the accident.

6. The Appeal Board found that the Staff was not legally barred from continuing to conduct a parallel investigation of the Hartman allegations. ALAB-738, 18 NRC at 188 n.14 (citing Securities and Exchange Commission v. Dresser Industries, Inc., 628 F.2d 1368 (D.C. Cir.) (in banc), *cert. denied*, 449 U.S. 993 (1980); CLI-80-22, 11 NRC at 729-30). The U.S. Attorney responsible for the criminal case stated at the sentencing hearing that "The NRC has not conducted any meaningful investigation: to this day has used as a pretext that [sic] fact that the Grand Jury was conducting an investigation as a vehicle to avoid addressing its responsibilities." TMIA App. at 820.

leak data in violation of safety regulations.[7] At the plea hearing, the United States Attorney outlined the evidence he would have introduced at trial. He stated that the falsification had been carried out with the express knowledge of supervisory personnel; that three supervisors told an operator who showed them a test result revealing excess leakage that "We do not want to see this shit"; and that even after an NRC inspector discovered this practice on October 18, 1978, and warned the licensee, the licensee made no changes in its faulty practice. After the warning, the licensee failed to make required reports to the NRC, and even sent false memoranda to the NRC investigators explaining proper procedures, which were purportedly, but not actually, provided to operators.

When the hearings on management integrity were conducted in 1981, the parties and the Licensing Board knew of the Hartman allegations. The issue was not developed in those hearings however, because, as the Appeal Board found, the NRC Staff "clearly discouraged any other party from pursuing this at the hearing." ALAB-738, 18 NRC AT 187; ; *see also* Majority Typescript at 34 n.16. The Staff issued two reports, one stating that it had suspended its investigation, and another relating that NRC personnel "had been requested by DOJ not to discuss the details of the matter." *Id.* It maintained that its investigation would resume *after* completion of the DOJ investigation. The Licensing Board therefore did not conduct hearings on the Hartman allegations, and when it issued its favorable determination on licensee's integrity it

7. The indictment charged Metropolitan Edison with 11 counts of criminal wrongdoing with respect to leak rate testing at TMI-2. The company pleaded guilty to one count charging it with failure to maintain an adequate leak rate test, and pleaded no contest to six other counts. Metropolitan Edison was convicted on these seven counts, while the other four were dismissed.

cautioned that the determination was conditional, "subject to" the DOJ investigation. LBP-81-32, 14 NRC 381, 557 (1981). The Appeal Board subsequently held that hearings were required on leak rate falsification since the record had never been closed on that issue, ALAB-738, 18 NRC AT 189, but the Commission reversed, CLI-85-2, 21 NRC 282 (1985), and to date not a single public hearing has been conducted on leak rate falsification. In overruling the Appeal Board, the Commission bypassed § 189(a) to apply the more stringent reopening standard, and relied primarily upon a statement by the United States Attorney and its own independent, off-the-record investigations of Michael Ross, Manager of Operations at TMI-1. The majority concludes that the Commission's decision to forego hearings on leak rate falsification was not an abuse of discretion.

In my view, both the Commission and the majority have applied the incorrect standard. The restart order promulgated by the Commission constitutes a license amendment, and the Commission's own initial actions and orders defined leak rate falsification as a material issue. As such, § 189(a) mandates that affected parties receive a hearing before the matter is decided.

The purpose of § 189(a) is to provide a public hearing upon request whenever the scope of a nuclear reactor's authority is altered by "the granting, suspending, revoking, or amending of any license ...." 42 U.S.C. § 2239(a)(1982); *see also Union of Concerned Scientists*, 735 F.2d at 1446-47. Congress has insisted upon retaining the statutory public hearing requirement in the face of NRC requests to eliminate it. *Id.* The case law furthers this congressional intent by requiring that all issues material to a license amendment determination be subject to a § 189(a) hearing upon a showing that petitioner's "interest may be affected." *San Luis*

Obispo Mothers for Peace, 751 F.2d at 1307, 1316; *Union of Concerned Scientists*, 735 F.2d at 1443; *Sholly v. United States Nuclear Regulatory Comm'n*, 651 F.2d 780, 790 (D.C. Cir. 1980), *vacated on other grounds*, 459 U.S. 1194 (1983).

Two questions are raised by petitioner's § 189(a) claim: (1) is this a license amendment proceeding; and if so, (2) is the leak rate falsification issue "material" to the proceeding.

The majority disposes of the § 189(a) claim on the first ground, concluding, despite agreement to the contrary by all parties, that the restart order does not amount to a license amendment. It contends that restart involves only the lifting of a license suspension, and not a license amendment. Although it cites no authority for this proposition, the majority apparently relies on *San Luis Obispo Mothers for Peace*. The court in that case held that the lifting of a license suspension, without more, does not trigger the § 189(a) hearing requirement, at least where such action simply reimposes the original license requirements and "does nothing to alter the original terms of a license." 751 F.2d at 1314.

The Commission's action here, however, is not a simple lifting of a license suspension. To suggest that the restart order "does nothing to alter the original terms of [the] license" is disingenuous. The restart order imposes 155 new conditions on a nominally different licensee. While there may be some situations in which the imposition of a few minor conditions would not amount to an amendment requiring a § 189(a) hearing, this is manifestly not such a situation.[8]

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8. The majority's references to 10 CFR § 2.200 et seq. (1985) do not refute the conclusion that this is an amendment proceeding, for those regulations simply set forth the procedural details

The purpose of a license is to set the legal terms under which a utility may operate a nuclear reactor. 42 U.S.C. § 2131 (1982) makes it unlawful to operate a nuclear reactor "except under and in accordance with a license issued by the Commission." It would appear to be beyond dispute that TMI-1 can no longer be operated "in accordance with" the terms of its original license.[9] The accident and its aftermath made it clear that the original license was no longer sufficient. As the Commission declared in July 1979, "the Commission presently lacks the requisite reasonable assurance that the ... licensee's Three Mile Island Alert No. 1 facility ... can be operated without endangering the health and safety of the public." Unpublished NRC Order (July 2, 1979), quoted at *Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit No. 1), CLI-79-8, 10 NRC 141, 142 (1979). The Commission's assurance that operation of a nuclear reactor will not be "inimical to the ... health and safety of the public" is an express prerequisite to issuance of a valid license. 42 U.S.C. § 2133(d) (1982); 10 C.F.R. § 50.40(d) (1985). Absence of such assurance will support revocation, suspension, or modification of the license. 10 C.F.R. § 50.100 (1985). The Commission's statement that it lacked assurance, therefore, marked a recognition that the original license was invalid, and hearings were ordered to determine whether the imposition of restrictive conditions would be "necessary and sufficient to

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governing "proceedings to modify, suspend, or revoke a license or for such other action as may be appropriate." 10 CFR § 2.202(a)((1979).

9. The majority states without explanation that we are not called upon to decide whether the 155 new conditions, by altering the terms of the existing license, constitute a de facto license amendment. Maj. Typescript at 24 n.13, despite an express argument to that effect by the Commonwealth of Pennsylvania. Commonwealth Br. at 25.

provide reasonable assurance" of safe operations. CLI-79-8, 10 NRC at 148.

If the licensee now sought to operate TMI-1 according to its original license terms, it would violate the 155 new conditions imposed. It is only under these conditions that "reasonable assurance" of safety exists, and it is only under these conditions that the licensee is authorized to operate. Since the original license is invalid, and the legal terms governing the operation of TMI-1 have been significantly altered, the license has been amended, and the hearing requirements of § 189(a) attach.

Once it is determined that the license has been amended, all issues "material" to that decision must be subject to a public hearing with a decision rendered on the record. *Union of Concerned Scientists*, 735 F.2d at 1444 n.12. The Commission's original orders defined management integrity and competence as an issue material to its restart determination. CLI-79-8, 10 NRC 141, 143 (1979), CLI-80-5, 11 NRC 408 (1980); CLI-81-9, 14 NRC 304 (1981). When the Appeal Board ordered hearings on leak rate falsification because the Staff and Licensing Board had postponed the hearings, it stated:

> [The] record on this point has never closed ... we cannot make any final judgment on appeal as to licensee's management competence and integrity without an adequate record. The Hartman allegations fall within the scope of the issues the Commission has directed be resolved through the hearing process. The absence of a materially complete record precludes us from reaching any conclusion on those issues, one way or the other. The Commission's primary commitment ... to a fair and thorough decision in this case requires no less than an exploration of Hartman's charges at hearing.

ALAB-738, 18 NRC at 189-90 (footnotes, citations, and cross-references omitted).[10]

Given these actions and statements by the Commission, the Staff, and both the Licensing and Appeal Board, I can only conclude that the leak rate falsification allegations were considered a material issue from the outset. As such, any interested party has a right to a hearing on that issue under § 189(a).[11]

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10. The leak rate falsification information was also listed in a May 19, 1983 memorandum to the Commission from the NRC's Executive Director for Operations, William J. Dircks, as an "open issue" yet to be addressed. See ALAB-738, 18 NRC at 182.

11. Respondents suggest rather formalistically that even if the restart order is considered a license amendment, petitioners are not "interested parties" under Bellotti v. Nuclear Regulatory Commission, 725 F.2d 1380 (D.C. Cir. 1983). *Bellotti* holds that the Commission has broad discretion in limiting the scope of a license amendment proceeding at its outset and that where it limits it to whether a safety plan, developed wholly outside the proceeding, should be adopted, only those parties opposing adoption of the plan have a right to request and participate in a hearing. 725 F.2d at 1382-83. I have serious doubts whether Congress meant to allow the Commission to invite to safety hearings on nuclear reactors only those parties who oppose safeguards. Surely "interested parties" include those who live in a reactor's vicinity and *favor* adoption of more safeguards as well as those who object to safeguards altogether. Any party who advocates a greater degree of safety would presumably prefer adoption of some plan to adoption of no plan, and that view at least should be heard.

Even were *Bellotti* persuasive, this case is distinguishable. In this proceeding, unlike in *Bellotti*, the Commission broadly defined the material issues to include the necessity for and *sufficiency of* conditions suggested by NRC Staff in the hearings to deal with management integrity problems. CLI-79-8, 10 NRC 141, 148 (1979). Thus, interested parties include those who oppose any conditions and those who oppose restart subject to the conditions imposed.

The Commission rejected petitioner's § 189(a) argument on the ground that the requisite hearings had been completed, but did not address the fact that inquiry into leak rate falsification had been foreclosed.[12] Applying the reopening standard, the Commission determined that in view of changes in the management structure of the operating company, a statement by the United States Attorney, and its own internal investigation of Michael Ross,[13] there was no need to hold hearings because those associated with leak rate falsification were no longer in relevant positions of operation or authority at TMI-1. In

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Whether the Commission would have abused its discretion had it chosen to restrict the scope of the proceedings as it did in *Bellotti* or *San Luis Obispo Mothers for Peace*, 750 F.2d at 1307, is not before us, because the Commission did not do so. This case is therefore more closely analogous to *Union of Concerned Scientists*, where the Commission sought to deny a hearing on an issue which the Commission itself had effectively defined as material to the licensing proceeding. 735 F.2d at 1443 (distinguishing *Bellotti*). The court there held that § 189(a) requires hearings on such material issues. The Commission in this proceeding has never suggested that leak rate falsification is not material to the management integrity question.

12. The Commission concedes that the reopening standard should not apply while there is "an inadequate record." CLI-85-2, 21 NRC 282, 285 n.3 (1985), but apparently concluded sub silentio either that an adequate hearing record had been compiled on leak rate falsification, or that it was "new evidence" discovered after the hearing. Both conclusions are unsupported by the procedural history of this proceeding.

13. Ross was and is the Manager of Operations at TMI-1, and there are allegations that he was aware of the leak rate falsification at TMI-2. The Commission recognized that Ross "may be the most important person on the TMI-1 operating team as far as the public health and safety is concerned." 14 NRC 381, 438 (1981), yet chose to resolve off the record the allegations regarding Ross's participation in the leak rate improprieties.

connection with its conclusion, the Commission issued an order barring certain former TMI-2 personnel from TMI-1. The majority upholds these actions as proper exercises of discretion, noting that while the Commission relied on off-the-record material to resolve the matter, it must necessarily do so when deciding whether to reopen a record to consider new evidence discovered after the hearing closed. The flaw in this reasoning is that leak rate falsification is not new evidence, but evidence which existed at the time of the hearing, the consideration of which was expressly postponed. The Commission has now made that postponement indefinite. Since leak rate falsification is an issue material to restart which has never been considered in a public hearing, it is improper for the Commission to rely on evidence not subject to hearings to decide the issue. 42 U.S.C. § 2239(a); *Union of Concerned Scientists*, 735 F.2d at 1444 n.12. his matter should therefore be remanded for a § 189(a) hearing on leak rate falsification at TMI-2.[14]

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14. Other persons remaining in GPU management who may be implicated in leak rate falsification include: Henry Shipman, plant engineer at TMI-2. TMIA App. at 828,887,2048; Richard Heward and Richard Wilson, GPU Vice Presidents who were senior managers at TMI-2. TMIA App. at 527-29, 531-32; Ed Frederick, Supervisor of Licensed Operator Training at TMI-1, who was an operator at TMI-2. TMIA App. at 1419; and Brian Mehler, Radiation Waste Operations Manager at TMI-1, who was a shift supervisor at TMI-2. 21 NRC at 298-99.

The hearings should consider the role and knowledge of top GPU and GPU Nuclear management regarding the practice of leak rate falsification, as well as the adequacy of the licensee's response after the practice was discovered by NRC officials in October, 1978. The inquiry should consider the impact of this evidence not only on particular individuals, but on the corporate character as a whole, with a view toward possible remedial and preventive measures. The hearings on leak rate falsification at TMI-2 should also consider evidence of leak rate

Even if it were concluded that the reopening standard, rather than § 189(a), should be applied to the TMI-2 leak rate falsification issue, I would hold that the Commission abused its discretion in refusing to reopen the record on that issue. The extra-record evidence upon which the Commission relied in deciding that a hearing was not required is insufficient in light of the importance of the matter at hand. As the majority observes, Maj. Typescript at 38-39, the Commission reached its decision in reliance on a statement by the United States Attorney at the sentencing hearing, which purportedly exculpated William G. Kuhns, Chairman of the Board of GPU and Herman M. Dieckamp, GPU President. This statement, however, is negative rather than affirmative. The U.S. Attorney stated only that the evidence "does not indicate" that certain persons *were* involved; he did not declare that the evidence indicated that the listed persons were in fact *not* involved. In addition, neither the Court nor the Commission is privy to the basis for the statement, because the grand jury investigation is secret. Perhaps most importantly, the statement was made as part of a guilty plea hearing, and as such may be the compromised result of a plea bargain agreement. It is curious that at the same time that the corporation pleaded guilty, presumably through a decision of its Board of Directors, the United States Attorney issued a statement purportedly exculpating all directors and officers of the defendant's successor, GPU Nuclear Corporation, as well as all directors of the defendant corporation itself, Metropolitan Edison. Given these inconsistencies, and the lack of any

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falsification at TMI-1. While this is arguably new evidence, it is sufficiently related to the TMI-2 leak rate falsification issue to merit consideration with it. It is particularly relevant with respect to determining whether Michael Ross was involved in or aware of the leak rate falsification practices.

evidentiary explanation to support the United States Attorney's conclusory statement. I believe the Commission abused its discretion in relying upon that statement.

The Commission similarly abused its discretion in rejecting without a hearing all charges that Michael Ross, Manager of Operations at TMI-1, may have been implicated in the TMI-2 leak rate falsification. The Commission presumed that *all* TMI-2 operators and supervisors were aware of the falsification, CLI-85-2, 21 NRC at 299 n.23, but at the same time dismissed as mere speculation the claim that Ross, who attended monthly TMI-2 supervisor's meetings, may also have known. *Id.* at 299, 313. Ross was cross-licensed at TMI-2, exchanged duties with the TMI-2 Manager of Operations, and apparently was in daily contact with the TMI-2 Manager. *Id.* at 295. Leak rate falsification occurred on a daily basis from January 1979 to March 1979, and for a significant period prior to 1979. Several operators testified that Ross, who was a stickler for detail, must have known about the falsification. Investivative Interview of Robert William Flannagan, Jr., TMIA App. p. 843; Investigative Interview of Tex Howard Acker, TMIA App. p. 847, 850; Investigative Interview of Joseph J. Chastwyk, TMIA App. pp. 876-77. Moreover, precisely the same methods of falsification -- adding hydrogen and discarding test results -- were used, though less frequently, at TMI-1. In light of this evidence, I believe the Commission abused its discretion in refusing to allow Ross to be questioned on this matter in a public hearing.[15]

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15. The majority notes that Ross was subjected to questioning at Licensing Board hearings for five days, suggesting that his examination was therefore complete. Maj. Typescript at 28, 37. The Appeal Board found, however, as the majority admits, that the NRC discouraged petitioners from pursuing the leak rate

IV.

With respect to the remaining issues, the Commission applied the proper reopening standard, but I believe that it abused its discretion in refusing to reopen the record to consider allegations concerning the inaccurate Keaten Report and the Notice of Violation (NOV) response. In my view, this issue raises sufficient questions concerning the integrity of current management personnel to warrant reopening the record for a further hearing.

The Keaten Report was the result of an internal investigation conducted by the licensee into certain aspects of the accident. The Report was prepared by a task force headed by Robert Keaten, currently Director of GPU Nuclear Engineering Projects, and Robert Long, now GPU Nuclear Vice President for Nuclear Assurance. The Report went through several drafts, and petitioners allege that a particular change was made in order to conform the Report to licensee's inaccurate response to a Notice of Violation issued by the NRC. The licensee's response stated inaccurately that the licensee's failure to follow certain procedures regarding a power operated relief valve did not delay recognition of the accident. The Keaten Report had originally contained accurate information that contradicted this disclaimer. Drafts of the Keaten Report and the NOV response were circulated among high-level GPU management, including R.C. Arnold, then licensee's Chief Nuclear Officer, and Herman Dieckamp, GPU President.[16]

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falsification issue at those hearings. Maj. Typescript at 34 n.16. Thus, it appears that Ross was not cross-examined on the leak rate falsification issue at all.

16. Dieckamp is a former Chairman and CEO of GPU Nuclear, and currently a member of GPU Nuclear's Board of Directors, as well as President, CEO, and Director of GPU.

The inconsistencies between the Keaten Report and the NOV response on an issue directly relevant to the accident itself raise serious questions about the integrity of management, particularly Dieckamp and Arnold. The NRC Staff itself concluded, after reviewing the investigation into this matter, that "statements were made by the licensee in its response to the NOV that were neither accurate nor complete and that were contrary to other information in the possession of the licensee." NUREG-06809, Supp. No. 5 at 8-19. It concluded further that responsibility must be borne by, among others, Dieckamp, "who reviewed the response before it was submitted and chose 'not to intervene.'"[17] *Id.* Dieckamp admits that he found the response "kind of thin." 21 NRC at 334.

This information did not warrant reopening, according to the Commission, on the ground that it was reasonable for management to rely upon Ed Wallace, a licensing manager who originated the false statements. It does not appear appropriate for the Commission to overlook so casually the actions of management as high as the President of the parent company.[18]

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17. This issue was one of four grounds which the Staff cited as support for its statement that had it been aware in 1981 of what it knew in 1984 about licensee misconduct, it probably would not have advocated a favorable determination regarding management integrity.

18. Moreover, this may not be an isolated incident. Dieckamp was also implicated in sending a mailgram to Representative Morris Udall and NRC Commissioners containing similarly incorrect information regarding another signpost to the accident. Members of Congress and staff on the House Committee on the Interior and Insular Affairs had toured TMI two days previously. Representative Udall is the Chairman of the Committee's Subcommittee on Energy and the

V.

In holding that no further hearings are necessary, the majority emphasizes that extensive hearings have already taken place, and that our scope of review of NRC agency action is narrow. I would not dispute that extensive hearings have been conducted, covering and resolving many areas of concern. Nor do I dispute that the scope of our review is circumscribed. So long as significant issues of integrity remain unexamined, however, I cannot conclude that the hearings were sufficient in all respects. The majority concedes that "the NRC did not actively pursue the matter [of leak rate falsification at TMI-2] and may have at least implicitly discouraged petitioner from doing so." Maj. Typescript at 34 n.16. It is no response to state that 155 days of hearing were held, when it is admitted that none of those hearing days concerned the issue that ultimately led to the licensee's criminal conviction for safety violations.

Although considerable deference must be accorded to Commission decisions, that deference must not be absolute. The decision by the Commission to forego hearings on management integrity is *not* the type of scientific judgment involving technical expertise that the Supreme Court has said requires special deference. See *Baltimore Gas & Electric Co. v. National Resources Defense Council*, 462 U.S. 87, 97 (1983). On the matter of management integrity and character,

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Environment. The Appeal Board ordered that further hearings be conducted on the mailgram issue, and while the hearings have been completed, the Licensing Board has yet to issue a decision.

A hearing on the Keaten Report and NOV response, as with leak rate falsification, see supra note 13, should consider what light these practices shed both on the particular individuals involved and the corporate character generally.

courts would seem to have no less expertise than administrative agencies.

In addition, we are not asked to review the agency's decision on the merits of the licensee's integrity, but only its procedural decision not to afford a public hearing before reaching judgment on this issue. Thus, I do not recommend that the reactor not be restarted at all, but only that it not be restarted without further hearings on management integrity. While it is true that Congress assigned to the NRC responsibility for making "risk assessment and policy choices", Maj. Typescript at 55, it is also true that Congress established legal procedures assuring public hearings that are capable of, and require, judicial enforcement. *See, e.g., Union of Concerned Scientists*, 735 F.2d 1437. Where Congress demands a mandatory public hearing, it is the court's duty to ensure that such a hearing takes place. I respectfully suggest that the refusal to hold such a hearing is at odds with § 189(a), and is also an abuse of discretion under the reopening standard. I would therefore remand for limited hearings on leak rate falsification and on the Keaten Report allegations.

In adopting a public policy in favor of nuclear power development, Congress created a regulatory process designed to allay the public's concern about accidents with potentially devastating consequences. The case of Three Mile Island is a fundamental test of that process. The accident at TMI-2 was the most serious in the nuclear power industry's history. Evidence of leak rate falsification by the licensee was strong enough to support a conviction in federal court. While many of the individual targets of the misconduct allegations are now barred from TMI-1, the evidence petitioners seek to present bears directly on the integrity and competence of current TMI-1 management, including an official with central

responsibility for public health and safety. Yet, because the grand jury's investigation was secret, and because of the Commission's decision, none of this evidence has ever been the subject of a public hearing.

It is true that regulatory proceedings can not go on interminably. It is also true that to some extent, the Commission must rely on its licensees in the daily operation of reactors. For just this reason, however, evidence that a licensee has falsified the results of safety tests merits special attention. No charge could be more damaging to public confidence in the safety of nuclear power production. The reactor's neighbors must bear the immediate physical and psychological burden of the March 1979 accident. But communities across the nation are looking to the Commission for assurance that they will not be victims of the next accident. They deserve a hearing on serious evidence of a licensee's misconduct before TMI-1 is allowed to restart.

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for the Third Circuit

(A.O. U.S. Courts. G.M.C. Printing, Phila., Pa. 215-568-4264)

UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

Nos. 85-3301, 85-3302, 83-3310, 85-3315

THREE MILE ISLAND ALERT, INC., et al.
Petitioner, No. 85-3301

COMMONWEALTH OF PENNSYLVANIA,
Petitioner, 85-3302

UNION OF CONCERNED SCIENTISTS,
Petitioner, 85-3310

NORMAN A. AAMODT and MARJORIE M. AAMODT,
Petitioner, 85-3315

vs.

UNITED STATES NUCLEAR REGULATORY COMMISSION, NUNZIO J. PALLADINO, CHAIRMAN, and UNITED STATES OF AMERICA.

Respondents

METROPOLITAN EDISON CO., JERSEY CENTRAL POWER & LIGHT CO., PENNA. ELECTRIC CO., and GPU NUCLEAR CORP.,

Intervenors

(Docket No. 50-289 SP)

PRESENT: SEITZ, ADAMS and STAPLETON,
Circuit Judges

ORDER

The various communications of the petitioners having been considered and having been treated as motions to continue the stay order of June 7, 1985, pending the dispositions of any petitions for rehearing in banc, and having considered the opposition of the intervenor/ respondents, it is

ORDERED that the stay order of June 7, 1985, shall remain in effect pending the determination of any petitions for rehearing in banc that may be timely filed, it being understood that there shall be no extension of time for filing such petitions beyond that permitted by F.R.A.P. 40

FURTHER ORDERED that in view of this order the Commonwealth's motion to hold the respondents in contempt is denied as

moot.

By the Court:

_____
Circuit Judge

DATED: August 29, 1985

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONER:

Nunzio J. Palladino, Chairman
Thomas M. Roberts
James K. Asselstine
Frederick M. Bernthal
Lando W. Zech, Jr.

In the Matter of	:
METROPOLITAN EDISON COMPANY	:
(Three Miles Island Nuclear Station, Unit No. 1)	:

Served May 29, 1985
Docket No. 50-289 SP
(Restart)

MEMORANDUM AND ORDER

CLI-85-09

I. Introduction and Summary

Three Mile Island, Unit 1 (TMI-1) has not operated since February 15, 1979, when its operator, Metropolitan Edison Company,

shut it down for refueling.[1] Following the March 28, 1979 accident at TMI-2, the Commission on July 2, 1979 issued an immediately effective enforcement order (unpublished) directing that TMI-1 remain shut down until further order. In an August 9, 1979 Order the Commission explained the basis for its shutdown decision and established the restart proceeding to determine whether TMI-1 should be allowed to resume operation. CLI-79-8, 10 NRC 141. Exhaustive hearings have been held in the restart proceeding, and only two issues, both management-related, remain pending before the agency. The agency's appellate review

[1] As a result of a corporate reorganization effective January 1, 1982, General Public Utilities Nuclear Corp. (GPU Nuclear) replaced Metropolitan Edison Company as licensee. Licensee will be referred to throughout this Order as licensee, GPU Nuclear, or GPUN. Reference will also be made to General Public Utilities Corp. (GPU), the parent company of GPU Nuclear.

of the Atomic Safety and Licensing Board's ("Licensing Board") decision on the adequacy of GPUN's training program is underway, and the Licensing Board is currently preparing its decision on the Dieckamp mailgram issue.

In today's decision for the reasons that follow, the Commission, after setting forth its overall views on licensee's competence and integrity, concludes that the two remaining management issues do not raise concerns warranting maintaining the immediate effectiveness of the shutdown Orders, and therefore that lifting the effectiveness of these Orders is required. This decision lifts the effectiveness of the shutdown Orders, an action which permits TMI-1 to resume operation, subject to satisfactory completion of the conditions imposed in this order.

The Commission's review of whether to

lift the immediate effectiveness of the 1979 shutdown Orders has taken considerably longer than the Commission originally anticipated because of a succession of events and the development of new information following the initial closing of the formal adjudicatory record in 1981. The Commission evaluated whether that new information warranted reopening of the record in an Order dated February 25, 1985, and concluded that it did not. CLI-85-2, 21 NRC 282. Some of that new information is also discussed in today's decision.

Because of the unique nature of this proceeding, the Commission has decided also to address certain other concerns which have been brought to its attention in the context of the restart proceeding, but which fall outside the scope of the proceeding.

II. Background

A. Establishment of the Proceeding -- Effectiveness and appellate Reviews

The law normally affords a licensee the opportunity to challenge an enforcement action in a public hearing prior to the time an enforcement action takes effect:

> The norm for administrative action modifying outstanding licenses embraces a prior opportunity to be heard...
> [I]t has always been recognized that summary administrative action substantially curtailing existing rights...is a 'drastic procedure.' Fahay v. Mallonee, 332 U.S. 245, 253 (1947). See Ewing v. Mytinger & Casselberry, Inc., 339 U.S. 594, 599 (1950); Davis, Administrative Law Sec. 7.08.

Consumers Power Company (Midland Plant, Units 1 and 2), CLI-73-38, 6 AEC 1082, 1083 (1973).

In this case, however, the Commission determined in 1979 that the public health,

safety and interest required making the shutdown Orders immediately effective.[2] Since the law obligates the Commission to lift the effectiveness of an immediately effective shutdown order once the concerns which led to making the order immediately effective have been adequately resolved, see, e.g., Pan American Airways v. C.A.B., 684 F.2d 31 (D.C. Cir. 1982); Northwest Airlines v. CAB, 539 F.2d 738 (D.C. Cir. 1976); Air Line Pilots Ass'n., International v. C.A.B., 458 F.2d 846 (D.C. Cir. 1972), cert. denied, 420 U.S.

[2] In the Commission's July 2, 1979 Order directing that TMI-1 remain shut down pending further order, the Commission stated that it lacked the "requisite reasonable assurance" that Unit 1 "can be operated without endangering the health and safety of the public," and that "it is in the public interest that a hearing precede restart of the facility." This step was taken based upon a provision in the law that allows such immediate action when required by the public health and safety or public interest. See 10 CFR 2.202(f), which implements 5 U.S.C. Sec. 558(c).

972 (1975), the Commission provided for a dual review of the Licensing Board's decision. One review as the normal appellate review which consisted of appeals of Licensing Board decisions to the Atomic Safety and Licensing Appeal Board ("Appeal Board") and then to the Commission.[3] The other, the "effectiveness review," involved determining whether to lift the immediate effectiveness of the shutdown Orders and authorizing plant operation during the pendency of the appellate review. See CLI-79-8, 10 NRC 141, 149 (1979). The "effectiveness" review, which involves "the most discretionary aspects" of the Commission's

[3] The Commission originally intended to conduct the appellate review of the Licensing Board's decision itself. Because of the complexity of the proceeding, the Commission subsequently established an Appeal Board to hear initial appeals. CLI-81-9-19, 14 NRC 304 (1981).

enforcement authority, CLI-81-34, 14 NRC 1097, 1098 (1981), originally consisted of a review of decisions rendered by the Boards, other relevant information provided to the parties for comment, and party comments.

These two independent reviews have been simultaneously underway since the Licensing Board issued its first Partial Initial Decision. While the Commission originally anticipated that the effectiveness review would be completed before any of the appellate review was finished, the appellate review has been completed on all but the two remaining management issues, namely, training and the Dieckamp mailgram. Accordingly, the Commission's effectiveness review is now limited to whether the concerns regarding those two issues are such as to warrant maintaining the effectiveness of the

shutdown Orders.[4]

Today's decision is based on the record of the formal adjudication. This record includes the relevant adjudicatory decisions, and other matters and papers filed in the formal adjudication, including information presented in motions to reopen the record and non-disputable matters such as personnel changes.

B. Proceedings Before the Licensing Board

The Licensing Board to date has issued four Partial Initial Decisions in

[4] Neither the Licensing Board's forthcoming decision on the Dieckamp mailgram nor the appellate review of that decision and the training decision will be prejudiced by this effectiveness decision. If the Licensing Board, or the Appeal Board or Commission as part of the appellate review, should determine that additional measures are required, appropriate action will be taken.

this proceeding.[5] The first set forth the procedural background of the hearing and contained the Board's findings on the management competence of GPU Nuclear. Among the issues addressed in that decision were licensee's management structure, the adequacy of its operator training program, its safety-related maintenance and repair procedures, management's response to the TMI-2 accident, and the licensee's technical capability and resources. LBP-81-32, 14 NRC 381 (August 27, 1981). With the exception of a subissue involving possible cheating on operator license examinations, over which it retained jurisdiction,[6]

[5] Over 155 days of adjudicatory hearings have been held in this proceeding, and thirteen parties have participated. In addition, thousands of members of the public who were not parties to the proceeding have provided written andor oral statement.

[6] Shortly before the issuance of the

the Board's conclusions on the management issues were favorable to resumed operation of TMI-1.[7] On October 2, 1981, the Licensing Board reopened the record to hear evidence on the implications of the information on cheating, and appointed a Special Master to hear the evidence.

On December 14, 1981 the Licensing Board issued a Partial Initial Decision on hardware design issues, the separation of Units 1 and 2, and emergency planning. This decision was also favorable to

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Board's first decision, the NRC staff notified the Licensing Board of its investigation into alleged cheating by two of licensee's senior reactor operators on NRC-administered, operator license exams. In light of this development the Board retained jurisdiction "to consider further the effect of the investigation of cheating on our decision subsequent to the issuance of the investigation report." 14 NRC at 403.

[7] The Board, however, imposed ten license conditions regarding management, if licensee were permitted to restart TMI-1.

restart, subject to correction of various deficiences. LBP-81-59, 14 NRC 1211, 1711.

The Special Master issued his recommended findings on the cheating issues on April 28, 1982. LBP-82-34B, 15 NRC 918. After reviewing the Special Master's Report, and the parties' written comments on that Report, the Licensing Board on July 27, 1982 issued its Third Partial Initial Decision, which addressed the cheating incidents. The Board, imposing four conditions on the licensee's training program, concluded that the issues in the reopened proceeding "have been resolved in favor of restarting Three Mile Island Unit 1", and that the conclusions of the two earlier Partial Initial Decisions remained in effect. LBP-82-56, 16 NRC 281, 385.

On May 3, 1985, the Licensing Board issued its Fourth Partial Initial

Decision.[8] LBP-85-15, 21 NRC ___. That decision, issued in response to the Appeal Board's remand in ALAB-772, see discussion infra, addressed the adequacy of GPU Nuclear's licensed operator training program. The Licensing Board found the training program adequate, provided that GPU Nuclear "institute a procedure for evaluating after training the performance of its trained operators in the job setting for revision of the training program." Slip op. at 214. The Board retained jurisdiction "solely for the purpose of approving the plan for job-performance evaluation," id., but held that the plan did not have to be developed or approved prior to restart.

[8] In response to a Commission request in CLI-85-2, the Licensing Board on April 11, 1985 provided its ultimate conclusion on the trailing issue and the essence of the supporting rationale. LBP-85-10, 21 NRC ___.

C. appellate review

In the emergency planning area, the Appeal Board, although it modified somewhat the Licensing Board's decision, found that the plans were adequate once all required conditions were met. ALAB-697, 16 NRC 1265; ALAB-698, 16 NRC 1290 (1982). On September 8, 1983, the Commission completed its review of ALAB-697 and ALAB 698 and, reinstating a condition regarding staffing of the emergency offsite facility imposed by the Licensing Board, concluded that emergency planning for TMI-1 is adequate, subject to necessary staff certifications.[9] CLI-83-22, 18 NRC 299 (1983).

In the hardware area, the Appeal Board in ALAB-729, 17 NRC 814 (1983),

[9] Staff on April 2, 1985 certified that the conditions related to emergency preparedness had been satisfied.

found in favor of restart.[10] The Commission took review of five issues in that opinion, and on July 26, 1984 resolved four of them on the basis of the record already developed in this proceeding. On the fifth issue, the Commission directed staff to certify the status of

[10] As a separate matter, the Appeal Board on June 30, 1982 requested Commission authorization to hear three issues sua sponte: (1) repair of the corroded steam generator tubes; (2) possible cracking in some high-pressure nozzles or their thermal sleeves; and (3) possible distortion of auxiliary feedwater spargers. The Commission, although it agreed that these issues "must be satisfactorily resolved before .. a decision on .. restart," decided to handle these issues outside of the restart proceedings. CLI-82-12, 16 NRC 1 (1982). The first issue is being addressed in the separate proceeding on the steam generator repairs at TMI-1. The Licensing Board issued a decision authorizing issuance of the license amendment necessary for operation wit the repaired steam generators, LBP-84-47, 20 NRC 1405 (1984) aff'd, ALAB-807, 21 NRC ___ (1985), and that amendment was issued. The latter two issues were addressed by the staff in SECY-82-502. Staff found no cracking in TMI-1 nozzles or sleeves and that the feedwater sparger issue was inapplicable to TMI-1. The Commission accepts the NRC staff's findings and is satisfied that these issues have been resolved.

environmental qualification for radiation of certain electrical equipment.[11] CLI-84-11, 20 NRC 1.

In the management area, the Appeal Board on August 31, 1983 reopened the record on allegations made by Mr. Harold Hartman, a former TMI-2 operator, which dealt with possible falsification of leak rate data at TMI-2 prior to the accident.[12] ALAB-738, 17 NRC 177.

[11] Staff on May 24, 1985 certified that the equipment was qualified.

[12] The Commission on October 7, 1983 took review of whether the hearing ordered by the Appeal Board should proceed prior to completion of an investigation into these allegations by the NRC's Office of Investigations and, to preserve the status quo, stayed the Appeal Board's decision while it conducted that review. Subsequently, the Department of Justice requested the Commission not to pursue this matter during the pendency of the criminal proceeding against Metropolitan Edison Co., United States v. Metropolitan Edison Co., No. 83-00188 (M.D. Pa.), and the Commission agreed to cooperate. After the criminal proceeding was settled via a plea agreement and resulting conviction, the Commission lifted the stay.

On May 24, 1984 the Appeal Board issued its decision on the rest of the management issues. ALAB-772, 19 RNC 1193. The Appeal Board found that the record needed further development on GPU Nuclear's licensed operator training program, and on a May 9, 1979 mailgram from GPU President Herman Dieckamp to Congressman Udall concerning the TMI-2 accident. The Appeal Board in ALAB-772 also granted a motion to reopen on pre-accident leak rate practices at TMI-1.

On September 11, 1984 the Commission took review of whether the hearings ordered by the Appeal Board in ALAB-738 and ALAB-772 were warranted, and whether any of the information in NUREG-0680, Supp. No. 5, TMI-1 Restart, An Evaluation of the Licensee's Management Integrity as it Affects Restart of Three Mile Island Nuclear Station Unit 1, Docket 50-289, (July 1984), ("NUREG-0680, Supp. No. 5"), CLI-84-17, 20 NRC 801 (1984).

warranted further hearings.[13] CLI-84-18, 20 NRC 808. On February 25, 1985, the Commission held that for public policy reasons the Licensing Board should issue its decision on the two remaining issues in this proceeding -- training and the Dieckamp mailgram -- but no other hearings were warranted within the restart proceeding. CLI-85-2, 21 NRC 282 (1985).

The Commission in CLI-85-2 fully explained why no further hearings were warranted within the restart proceeding. Briefly summarized, the Commission found that no issue met the standards for reopening, i.e., raised a significant safety concern which might have affected the Licensing Board's decision. With regard to the three most significant

[13] The NRC staff in NUREG-0680, Supp. No. 5 set forth its latest evaluation of licensee's management integrity, specifically focusing on matters addressed in numerous investigations conduced by the Commission's Office of Investigations.

issues discussed in CLI-85-2 -- TMI-2 leak rate falsifications, TMI-1 leak rate practices, and staff's "likely" change of position -- the Commission found as follows.

Personnel changes and procedural safeguards have mooted the significance of the TMI-2 leak rate falsifications for current TMI-1 operations.[14] Of those licensed to operate TMI-2 prior to the

[14] The Commission in CLI-85-2 stated that it would be instituting a proceeding separate from the restart proceeding on TMI-2 leak rate falsifications "to determine the ultimate status of those likely involved in the TMI-2 leak rate falsifications, which includes those licensee has segregated from operational duties at TMI-1 and those now working at other nuclear facilities." 21 NRC at 305. The Commission excluded from this hearing those cleared by the U.S. Attorney, and Michael Ross, cleared by OI's investigation. The Commission also offered Charles Husted an opportunity to request a hearing on a condition imposed by the Appeal Board which barred him from having any supervisory responsibilities insofar as the training of non-licensed personnel was concerned.

accident, only one -- Michael Ross -- is licensed to operate TMI-1, and he has been cleared of involvement in falsifications at TMI-2 by the NRC's Office of Investigations (OI) report. GPU Nuclear's upper management similarly has been cleared of involvement by the U.S. Attorney, based on a grand jury proceeding which led to the indictment of Metropolitan Edison Company. Hence the fact that individuals working at TMI-2 over six years ago may have falsified records has no significance to the current operation of TMI-1.

With regard to pre-accident TMI-1 leak rate practices, the Commission in CLI-85-2 explained that the circumstantial evidence of a few irregularities does not raise a current safety concern. OI investigated pre-accident TMI-1 leak rate practices, and found no pattern of falsifications, nor any motive to

falsify. While the OI investigation did identify some procedural violations, such as the practice of discarding test results, those violations are just one more example of pre-accident deficiencies at TMI, and their significance today is minimal at best. The purpose of the restart proceeding was to determine whether current practices at TMI-1 provide reasonable assurance of safe operation. Whether TMI-1 can be safely operated was extensively litigated, and the Commission is satisfied, based on the extensive examination of GPU Nuclear in this proceeding, that the personnel, procedures, and organization currently in place provide reasonable assurance that similar procedural deficiences will not recur.

The third significant issue in CLI-85-2 -- staff's "likely" change of position -- is also of minimal current

significance. Of the four events relied on by staff for its "likely" change of position, one (the Floyd certification) was fully litigated, and the other three (TMI-2 leak rate practices, pre-accident training irregularities, and licensee's response to the 1979 Notice of Violation) have no current significance. Therefore staff's "likely" change of position does not warrant further hearings.

Effectiveness review of management issues

The Commission as part of its effectiveness review of the Licensing Board's decisions has obtained written submissions from the parties, and has heard oral presentations by the parties on October 14, 1981 in Washington, D.C. on the Licensing Board's First Partial Initial Decision on management competence, and on November 9, 1982, in Harrisburg, Pennsylvania on the next two Licensing

Board Partial Initial Decision.[15] In addition, the Commission held an evening session in Harrisburg on November 9, 1982 where it heard from members of the public regarding the restart of TMI-1.[16]

Subsequent to receipt of the parties' comments on the Licensing Board's decision on the cheating incidents, there were numerous developments in the managements area which have led to additional oral and written presentations by the parties and have affected and substantially prolonged the Commission's review process. Although the Commission in CLI-85-2, 21 NRC 282 (1985), decided that none of this new

[15] The parties mentioned in today's decision are the Commonwealth of Pennsylvania (Commonwealth), the Union of Concerned Scientists (UCS), Three Mile Island Alert (TMIA), Marjorie and Norman Aamodt, the NRC staff, and the licensee.

[16] The Commission has also solicited and received numerous written submissions from the public on whether and, if so, under what conditions, TMI-1 should be restarted.

information warranted further hearings, as summarized supra, the Commission will briefly discuss the chronology of events in order to place today's decision in perspective.

On April 18, 1983, the NRC staff advised the Commission that because of the pendency of several matters that might bear on the competence and integrity of TMI-1 management, the so-called "open issues," the staff was initiating actions to "revalidate" its position that licensee management had sufficient integrity to operate the facility.[17] Staff in a May 19, 1983 memorandum to the Commission listed the following open issues: the General

[17] Staff "revalidated" its position in NUREG-0680, Supp. No. 5, concluding that "there is reasonable assurance that GPUN can and will conduct its licensed activities in accordance with regulatory requirements and that GPUN can and will operate TMI-1 without undue risk to the health and safety of the public." Id. at 13-10.

Public Utilities (GPU v. Babcock and Wilcox (B&W) lawsuit transcript review[18]; the Hartman allegations concerning leak

[18] GPU sued B&W in the United States District Court for the Southern District of New York (80 Civ. 1683(RO)), claiming that B&W, the manufacturer of the reactor's nuclear steam supply system, should be held liable for causing the TMI-2 accident. That lawsuit was settled after nearly three months of trial. Much of the information developed in that trial appeared to relate to licensee's management competence and integrity, and hence appeared relevant to the restart proceeding. Accordingly, the Commission directed the NRC staff to review the trial transcripts and the exhibits, whether introduced in evidence or not, to determine whether they contained new information relevant to restart. The Commission also provided the parties to the restart proceeding an opportunity to comment on these documents and the staff's review, and several parties submitted comments. Several issues arising from this review were referred to OI for investigation, and are discussed separately, infra.

The Appeal Board denied a motion to reopen the record based on the GPU v. B&W trial evidence, ALAB-738, 18 NRC 177, 195-197 (1983), and the Commission declined to take review of that holding.

rate falsifications at TMI-2;[19] the Parks, King, and Gischel allegations regarding improper practices and harassment at TMI-2 during the cleanup;[20]

[19] Harold Hartman, a reactor operator at TMI-2 prior to the accident, alleged that leak rate tests, which were used to assess whether primary system leakage surpassed technical specification limits, were purposely manipulated and records of such tests falsified or destroyed at TMI-2 prior to the accident to cover up the fact that over an extended period of time the results of the tests exceeded technical specification limits. The Commission in CLI-85-2 explained that these allegations do not raise a concern for current operation of TMI-1. See discussion supra.

[20] Messrs. King and Gischel were employed by GPU Nuclear in connection with the ongoing cleanup of TMI-2. Mr. Parks was employed by Bechtel. They alleged that established safety procedures were not being followed in conducting the cleanup, and that they had been harassed by management for raising these concerns. These allegations were referred to OI, which conducted separate investigations into the alleged procedural violations and the harassment claims. OI Report Nos. 11-83-002 (May 18, 1984), 11-83-002 (September 1, 1983). The Appeal Board prior to completion of the OI investigations denied a motion to reopen the record on these allegations. ALAB-738, 18 NRC 177, 197 (1983). Based on

concerns raised by the firm of Rohrer, Hibler and Replogle (RHR) and by Basic Energy Technology Associates, Inc. (BETA)

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the OI investigations, the Commission found that licensee had not discriminated against Messrs. King and Gischel. For the purpose of its analysis, the Commission accepted staff's conclusions that Mr. Parks had been discriminated against, but found that this single act of discrimination did not meet the standards for reopening, particularly given that the major GPUN official involved no longer was associated with TMI-1. CLI-85-2, 21 NRC 282, 327-29 (1985).

reports;[21] and questions regarding whether GPU failed promptly to notify the Commission or Appeal Board of material information in the RHR, BETA and other reports.[22]

[21] The RHR and BETA reports were prepared for licensee by outside consultants. The RHR report ["Priority Concerns of Licensed Nuclear Operators at TMI and Oyster Creek and Suggested Action Steps" (March 15, 1983)] dealt primarily with operator attitudes, while the BETA report ["A Review of Current and Projected Expenditures and Manpower Utilization for GPU Nuclear Corporation" (February 28, 1983)] was designed to evaluate operational efficiency. Both reports contained information that appeared to bear on issues in the restart proceeding, and hence were the subject of comments by several parties. Staff in NUREG-0680, Supp. No. 4 ["TMI-1 Restart -- An evaluation of the RHR, BETA, and Draft INPO Reports" (October, 1983)] evaluated these reports and found no significant new information. The Appeal Board denied a motion to reopen the record based on the substance of these reports. ALAB-774, 19 NRC 1350 (1984).

[22] The NRC staff concluded that the RHR and BETA reports were not provided to the NRC in a timely manner. This issue was referred to OI to determine why the reports were not provided at an earlier time. The OI investigation did not

Subsequently, additional questions were raised regarding the preparation of the Keaten report by GPU,[23] leak rate practices

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disclose evidence of a deliberate attempt by licensee management to withhold information contained in the RHR and BETA Reports from the NRC. OI Report No. 1-83-013, April 16, 1984. The Appeal Board denied a motion to reopen based on the reporting of these documents to the NRC, ALAB-774, 19 NRC 1350 (1984), as did the Commission. CLI-85-2, 21 NRC 282, 341 (1985).

[23] Questions regarding preparation of the Keaten report -- an internal GPU report on the TMI-2 accident written by a task force headed by R.W. Keaten -- arose from the review of the GPU v. B&W trial material. Essentially, this issue, which was investigated by OI, involves the propriety of changes made to drafts of the report by GPU management, and whether those changes reflect adversely on management's integrity. OI in its investigation did not find evidence of improper changes to the Keaten Report itself. However, OI did find that licensee in response to the NRC's October 25, 1979 Notice of Violation (NOV) had made inaccurate and incomplete statements. OI Report No. 1-83-012 (May 18, 1984). The Commission found that the removal of the individuals primarily responsible for the response to the NOV mooted any significance of this issue. CLI-85-2, 21 NRC 282, 323, 334 (1985).

at TMI-1,[24] pre-accident training irregularities,[25] changes to the Lucien Report,[26]

[24] The NRC staff in its abbreviated investigation into leak rate test practices at TMI-2 discovered some questionable data at TMI-1. Accordingly, OI was asked to investigate possible leak rate falsification at TMI-1. OI completed its investigation (OI Report Nos. 1-83-028 and 1-83-028, Supplement, April 16, 1984) shortly before the Appeal Board reopened the record on this issue in ALAB-772, 19 NRC 1193 (1984), rev'd CLI-85-2, 21 NRC 282 (1985). OI, although it identified some procedural irregularities, did not find either a pattern of falsifications or a motive to falsify. The Commission found that this issue did not meet the standards for reopening. See discussion supra.

[25] Staff in the review of the GPU v. B&W trial record found several pre-accident licensee memoranda which indicated possible regulatory violations in licensee's training program. OI conducted three separate inquiries into pre-accident training irregularities. OI Report Nos. Q-1-83-014 (May 31, 1983; Q-1-83-015 (July 26, 1983); Q-1-84-004 (March 22, 1984). OI determined that none of these inquiries warranted a full investigation. The Appeal Board in ALAB-774 denied a motion to reopen based on pre-accident training irregularities. 19 NRC 1350 (1984).

[26] The GPU v. B&W trial record review

and a change in operator testimony regarding the sequence of events during the accident.[27] Further, licensee was indicted for criminal acts in connection with the Hartman allegations, and subsequently pled guilty to one count and nolo contendere on six others. The United

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also led to an OI inquiry into changes made to a technical report regarding the accident prepared by K.P. Lucien of Energy Incorporated under contract to the licensee. OI Report No. Q-1-84-006 (May 18, 1984). Based on OI's investigation, the Commission found no direct evidence of wrongdoing, and concluded that hearings on this issue were not warranted. CLI-85-2, 21 NRC 282, 337 (1985).

[27] OI also investigated the causes of a change in testimony by licensee employees during the GPU v. B&W trial from their earlier statements concerning whether full-flow high pressure injection (HPI) had been manually initiated on the morning of the accident when the last two reactor coolant pumps were shutdown. OI Report No. 1-84-005 (July 13, 1984). The Commission found from OI's investigation that there was no factual evidence to support the charge that the change in testimony was improperly motivated, and that this issue did not warrant reopening. CLI-85-2, 21 NRC 282, 338 (1985).

States District Court for the Middle District of Pennsylvania on February 29, 1984 entered a judgment of guilty on the one count, and a judgment of conviction on the six counts to which Metropolitan Edison pled nolo contendere.

In response to these open issues, licensee on June 10, 1983 committed to several significant organizational changes. Licensee committed to reassign personnel such that "no TMI-2 licensed operator will operate TMI-1, with the exception of the Manager of Operations, Michael Ross."[28]

[28] The Licensing Board described Mr. Ross as possible "the most important person on the TMI-1 operating team as far as the public health and safety is concerned," 14 NRC at 439, and hence Mr. Ross has been closely examined throughout this proceeding. As explained in CLI-85-2, the Commission finds that TMI-1 can be operated safely with Mr. Ross in his current position. 21 NRC at 298-99 (1985).

The Commission in CLI-85-2 modified licensee's commitment and imposed it as a

Licensee also committed to "add full time on shift operational quality assurance [QA] coverage until the open issues are resolved."[29] Further, licensee stated that until the open issues were effectively resolved it would "reassign personnel such

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condition: "No pre-accident TMI-2 operator, shift supervisor, shift foreman, or any other individual both in the operating crew and on shift for training as a licensed operator at TMI-2 prior to the accident shall be employed at TMI-1 in a responsible management or operational position without specific Commission approval. 'Operational position' as used here includes any position involving actual operation of the plant, the direction or supervision of operators, or independent oversight of operations. This condition shall also apply to the pre-accident Vice-President, Generation, TMI-2 Station Manager, TMI-2 Supervisor of Technical Support (from January 1977 to November 1978), TMI-2 Superintendent of Technical Support (from December 1978 to the accident), and TMI-2 Supervisor of Operations. This condition shall not apply to Michael Ross, and Brian Mehler may continue in his present position consistent with this condition." 21 NRC at 341-42.

[29] See discussion supra for a listing of the "open issues."

that those functions which provide overview assessment, analysis, or audit of plant activities would contain only personnel with no pre-accident involvement as exempt Met Ed employees at TMI-1 or 2."[30] Finally, licensee committed to "reallocate the priorities and assignments within the Office of the President of GPU Nuclear."

The Commission on November 28, 1983 heard oral presentations from GPU on its June 10, 1983 management organization proposal and subsequent changes.[31]

[30] Mr. Clark at the November 28, 1983 Commission meeting explained that "the exempt classification [a payroll classification]...picks up all supervisory management, all people charged with the responsibility for directing the operation. It does not pick up the workers, the hands-on people, be they mechanics or clerks."

[31] The Commission heard oral presentations by the other parties on December 5, 1983 on GPU's proposal. Staff in its presentation set forth the conditions under which it believed TMI-1

GPU in its presentation stated that its June 10, 1983 plan had been implemented, and committed to taking the following further steps. First, GPU would elect to the GPU Nuclear Board of Directors three outside directors "with meaningful credentials and demonstrated independence." Second, these new directors would comprise a Nuclear Safety and Compliance Committee of the GPU Nuclear Board, and that Committee would employ a staff to monitor the operation

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could be safely operated, which included round-the-clock NRC inspection and a 25% power limitation.

and maintenance of the GPU system nuclear units.[32] Third, the Nuclear Safety and Compliance Committee would periodically issue reports regarding the operation and maintenance of the GPU system nuclear units, and those reports would promptly be provided to the NRC and the public. Fourth, Mr. Robert Arnold, who had been President of GPU Nuclear, was reassigned to non-nuclear work within the GPU system. Mr. Philip Clark, formerly

[32] Licensee notified the Commission on March 15, 1984 that Messrs. Lawrence L. Humphreys (Chief Executive Officer of UNC Nuclear Industries), Warren F. Witzig (Chariman, Nuclear Engineering Department, Pennsylvania State University), and Robert V. Laney (consultant in nuclear and energy project management) had been elected to the GPU Nuclear Board of Directors, and that they would make up the Nuclear Safety and Compliance Committee.

The Commission in CLI-85-2 adopted licensee's commitment as a condition: "Licensee, in the absence of Commission authorization to the contrary, is to retain its expanded Board of Directors and its Nuclear Safety and Compliance Committee." 21 NRC at 342.

Executive Vice President, replaced Mr. Arnold as President of GPU Nuclear, while Mr. E. E. Kintner, formerly Vice President, became Executive Vice President. Both Messrs. Clark and Kintner were elected members of the Board of Directors of GPU Nuclear.[33]

On January 27, 1984 the Commission set forth its tentative views and plan for resolution of management integrity issues prior to

[33] Subsequently, on February 6, 1984, GPU Nuclear announced further changes to its organization. Mr. John F. O'Leary, former Deputy Secretary of the Department of Energy and GPU Board member since October 1979, was elected Chairman of GPU Nuclear. Mr. Clark, President and Chief Operating Office of Gpu Nuclear, was also appointed Chief Executive Officer. Mr. Herman Dieckamp, former Chairman and Chief Executive Office of GPU Nuclear since its inception, remained only as a member of the Board of Directors of GPU Nuclear, although he continued to hold the positions of President, Chief Operating Officer, and a member of the Board of Directors of GPU.

restart.[34] The Commission stated that the only then-ongoing OI investigation which might require further resolution prior to a decision on the management issues was the Unit 1 leak rate investigation. The Commission explained "that, in principle, temporary separation from nuclear operations of some GPU employees and other actions, including those proposed by the licensee, can serve as an interim solution to the management integrity issues raised by the 'open items,' pending resolution of those items." The Commission also noted

[34] The Commission on January 20, 1984 provided the parties with a list of integrity issues for comment. This list represented a compilation of issues having as their bases "facts or disputes about facts raised during the restart proceeding or thereafter, and which at face value appear to have some possible connection with management integrity." This list was designed to assist the Commission in identifying and evaluating issues concerning licensee's integrity. Licensee, staff, TMIA, the Aamodts, UCS, and the Commonwealth commented on that list.

its view, "based on currently available information,...that neither Chariman of the Board William Kuhns nor President of GPU Herman Dieckamp will have to be temporarily or permanently separated from nuclear operations prior to restart."

The Commission on June 1, 1984 requested the parties "to comment on whether, in view of ALAB-772 and all other relevant information, including investigative reports by the Office of Investigations, the management concerns which led to making the 1979 shutdown orders immediately effective have been sufficiently resolved so that the Commission should lift the immediate effectiveness of those orders prior to completion of review of any appeals from ALAB-772." Licensee, staff, TMIA, the Aamodts, UCS and the Commonwealth submitted comments, and the Commission heard oral presentations from the parties

on August 15, 1984.

Staff, as part of its comments, provided its "revalidation" of licensee's management in NUREG-0680, Supp. No. 5. Staff in that evaluation found a "pattern of activity on the part of...Met-Ed [which], had it been known at the time [of the Licensing Board proceeding on TMI-1 restart], would likely have resulted in a conclusion by the staff that the license had not met the standard of reasonable assurance of no undue risk to public health and safety." Id. at 1305. With regard to the current licensee, GPU Nuclear, staff balanced the past improper acts of Metropolitan Edison against GPU Nuclear's record of remedial actions and performance, including the record of current senior management, and concluded that GPU Nuclear was acceptable.

The Commission, in its September 11, 1984 Order taking review of whether

further hearings should be held, stated it would not rule "on whether to lift the immediate effectiveness of the 1979 shutdown orders until after it has decided on what further evidentiary hearings, if any, are required in the restart proceeding." The Commission further stated that, if it "decides that further hearings are required, it will decide whether the public health, safety and interest require completion of those hearings prior to a decision on lifting effectiveness." CLI-84-18, 20 NRC 808, 809 (1984).

After the Commission decided what further hearings were required and the Licensing Board issued its partial initial decision on GPU Nuclear's licensed operator training program, the Commission heard oral presentations from the parties on May 22, 1985. The parties in their presentations addressed both the training

decision and the overall question of whether the Commission should now lift the immediate effectiveness of the shutdown Orders.

III. The Commission's Effectiveness Decision

The Commission in CLI-85-2 decided that for public policy reasons the Licensing Board should issue a decision on the two issues remaining in this proceeding, training and the Dieckamp mailgram. The Commission further decided that hearings in the restart proceeding were not warranted on any other issue. The question before the Commission now is accordingly limited to whether any concerns regarding the training issue are such as to warrant maintaining the immediate effectiveness of the shutdown Orders prior to completion of the agency's

appellate review of that issue, and whether any concerns regarding the mailgram issue warrant maintaining the effectiveness of the shutdown orders at least until the Licensing Board issues a decision on that issue.[35]

As explained below, the Commission has decided that these two issues do not raise serious questions about whether TMI-1 can be safely operated, and accordingly do not warrant keeping TMI-1 shutdown until agency proceedings have been completed. The Commission, after first placing these two issues in perspective by providing a general

[35] Were the Commission to wait for completion of the proceedings before the Licensing Board, it would then have to decide whether to await completion of the appellate review. As explained infra, the Dieckamp mailgram issue does not raise health and safety concerns that warrant maintaining the immediate effectiveness of the shutdown Orders. Therefore, there is no reason to postpone a decision until the Licensing Board issues its decision.

overview of the competence and integrity issues, will discuss below why these two issues do not raise serious questions about the current safe operation of TMI-1. The Commission will then address procedural issues raised by intervenors. Finally, the Commission will discuss staff's proposals of round-the-clock NRC inspection and a 25% power limitation.

A. Management Competence and Integrity

1. Introduction

In the Commission's August 9, 1979 Order, the Commission directed the Licensing Board to evaluate whether licensee had sufficient managerial capability and resources to operate TMI-1 safely. 10 NRC 141, 145. In a subsequent Order issued on March 6, 1980, the Commission gave the Licensing Board specific guidance on areas to be addressed in determining whether management had

sufficient competence to operate the facility. CLI-80-5, 11 NRC 408 (1980).[36] The Licensing Board addressed these issues in its Partial Initial Decision of August 27, 1981, LBP-81032, 14 NRC 381, and reassessed management competence after the cheating incidents in its Partial Initial Decision of July 27, 1982. LBP-82-56, 16 NRC 281.

The Appeal Board in its review of the

[36] The Commission in that Order directed the Licensing Board "to examine the following broad issues: (1) whether Metropolitan Edison's management is sufficiently staffed, has sufficient resources and is appropriately organized to operate Unit 1 safely; (2) whether facts revealed by the accident at Three Mile Island Unit 2 present questions concerning management competence which must be resolved before Metropolitan Edison can be found competent to operate Unit 1 safely; and (3) whether Metropolitan Edison is capable of operating Unit 1 safely while simultaneously conducting the clean-up operation at Unit 2." CLI-80-5, 11 N.R.C. 408, 408 (1980). The Commission then went on to list 13 specific issues for the Licensing Board to examine in the course of examining the broad questions.

Licensing Board's decisions reopened the record on four management-related issues: the adequacy of training, the accuracy of the Dieckamp mailgram, pre-accident TMI-1 leak rate practices, and TMI-2 leak rate falsifications. The Appeal Board found the record on the remaining management issues to be adequate, and affirmed the Licensing Board's findings on those issues.

The Commission in CLI-85-2 reversed the Appeal Board's decision to reopen the record on TMI-1 leak rate practices and TMI-2 leak rate falsifications. 21 NRC 282 (1985). The Commission, having carefully reviewed the Appeal Board decision on the management issues, is satisfied that the Appeal Board has thoroughly evaluated the major issues relating to management, and endorses its favorable substantive findings on licensee's management. The Commission

addressed the Appeal Board's conclusion that further hearings are required in CLI-85-2. The Appeal Board decisions, the Commission's decision in CLI-85-2, the Licensing Board's May 3, 1985 decision on training, and the underlying adjudicatory record constitute the basis for the Commission's finding that GPU Nuclear has sufficient competence and integrity to operate TMI-1 safely. Nevertheless, because the management competence and integrity issues are so significant, for completeness, before addressing the training and Dieckamp mailgram issues, we will summarize here our reasons for endorsing the overall favorable findings in the adjudicatory proceeding on the management issues.

2. Overview

The Commission has indicated that the broad issues regarding competence to be considered in this proceeding are whether

GPU Nuclear management "is sufficiently staffed, has sufficient resources and is appropriately organized to operate Unit 1 safely." CLI-80-5, 11 NRC 408 (1980). Essentially, the issue of competence concerns whether GPU Nuclear has the technical resources and capabilities to provide reasonable assurance that TMI-1 will be operated safely.

The concept of "integrity," or "character," is a more difficult one to define. See generally, e.g., ALAB-772, 19 NRC 1193, 1206-1208; Houston Lighting and Power Company (South Texas Project, Units 1 and 2), LBP-84-13, 19 NRC 659 (1984). A generally applicable standard for integrity is whether there is reasonable assurance that the licensee has sufficient character to operate the plant in a manner consistent with the public health and safety and applicable NRC requirements. The Commission in making this

determination may consider evidence regarding licensee behavior having a rational connection to the safe operation of a nuclear power plant.[37] This does not mean, however, that every act of licensee is relevant. Actions must have some reasonable relationship to licensee's character, i.e., its candor, truthfulness, willingness to abide by regulatory requirements, and acceptance of responsibility to protect health and safety. In addition, acts bearing on character generally should not be considered in isolation. The pattern of licensee's relevant behavior, including corrective actions, should be considered.

Without question, the Metropolitan Edison management of TMI-2 prior to and

[37] The references to "licensee behavior" include acts of licensee employees, since all organizations carry on their activities through individuals.

immediately following the March 28, 1979 accident failed to provide the climate, resources, attitude, and leadership that the Commission expects of a licensee. We note that a portion of this proceeding and the parties' efforts have been devoted to demonstrating management's failures prior to the accident, which include the events leading to the criminal conviction of Metropolitan Edison. However, those past events are six years old, and the company responsible no longer operates TMI-1.[38] The Commission's responsibility and concern is with the management and company that would operate Unit 1 today, and with their willingness and ability to operate the

[38] Not only does a company with a different name now have responsibility for operation of TMI-1, but the organizational structure is substantially modified from the previous company and a substantial number of the individuals in direct management of TMI-1 at the time of the accident have been replaced. See discussion infra.

plant according to the high standards that we require and that the public demands and deserves. Therefore, the Commission rests its decision on evidence demonstrating that past inadequacies have been corrected, and that the current company and management have the necessary competence and integrity to provide reasonable assurance that TMI-1 will be operated consistent with public health and safety and the Commission's requirements.

GPU Nuclear has replaced Metropolitan Edison as the company responsible for operation for TMI-1. GPU Nuclear has a new chairman and revised Board of Directors, a new President, Executive Vice President, Vice President of TMI-1, Chairman of the General Operations Review Board, and numerous other lower-level managers, as well as a substantially modified organizational structure and operational

procedures.[39] It is the qualifications of this management, not the management of six years ago, that the Commission is now evaluating. The Commission is satisfied that current management has both the necessary competence and integrity to operate TMI-1 safely.

The Commission in reaching its favorable conclusion regarding management competence and integrity has considered the depth with which the performance and plans of the licensee have been examined. Indeed, because of the TMI-2 accident, the Commission has examined the management of

[39] See 14 NRC at 403 et al. Philip Clark, GPUN President, informed the Commission during oral presentations on August 15, 1984 of the current figures. Of the twelve senior GPUN employees, eight joined the GPU system after the TMI-2 accident. Three of the remaining four had no involvement with Metropolitan Edison. Of 435 key personnel (including managers, technical professional and licensed operators), 235 joined GPU after the accident and another 100 had been employed within the GPU system prior to the accident but not with Metropolitan Edison.

this utility more extensively than in any other case in NRC's history. That examination has shown that present GPU Nuclear management is fundamentally sound. Personnel changes in GPU Nuclear management in 1983-84 (which were not in dispute) even further support this conclusion.[40]

With regard to licensee's overall competence, licensee in the initial proceeding on management issues made a strong affirmative showing of the overall strength of its management structure, human resources, safety review process, and shift staffing commitments. The GPU Nuclear structure provides dedicated technical resources to operate GPU's nuclear facilities, thus minimizing resource competition from the non-nuclear

[40] No party moved to reopen the record based on these personnel changes.

aspects of GPU operations. The organization of GPU Nuclear provides significantly greater technical resources and more logically organized and accountable functional relationships than existed in Metropolitan Edison. The quantity of technical resources applied to nuclear operations has been significantly increased.[41] Those GPUN managers new to the GPU system since the accident have extensive experience and significant technical qualifications that adequately correct pre-accident failings.

[41] See 14 NRD at 413. On August 15, 1984 GPU Nuclear provided the Commission with current information on its technical resources. Approximately 915 full-time company employees devote their efforts to TMI-1. Of these 435 are key personnel, including managers, technical professional positions, and licensed operators. Prior to the TMI-2 accident, Metropolitan Edison devoted approximately 315 employees to TMI-1, including 127 key personnel. Prior to the accident the TMI training staff was comprised of seven individuals. It now has 55.

The training department has increased its staff, significantly expanded and modified the curriculum, and significantly increased the time devoted to operator training. An entirely revised maintenance system has been put in place since the accident. Subsequent allegations that management aided cheating were not proven during an extensive hearing. While the cheating should not have occurred, the Commission finds that, because present GPU Nuclear management did not participate in, encourage, or condone the cheating, those incidents do not undermine the overall competence of GPU Nuclear management to operate TMI-1 safely.

The Commission finds, considering the above factors, that license's current management has the requisite competence to provide reasonable assurance that TMI-1 can be operated safely.

With regard to licensee's integrity,

the restart proceeding would not have been as lengthy and complex as it has been had licensee's performance been exemplary. The licensee's performance since the accident has been marred first and foremost by the cheating incidents. In this connection the Commission notes not only the cheating itself, but licensee's early unwillingness in a few particular instances to acknowledge the fact of cheating and to take prompt disciplinary action against those responsible.[42]

GPU Nuclear was also responsible for several procedural violations during the TMI-2 cleanup, for procedural violations at TMI-1 found in the October 28, 1983 Region I inspection report, and for the harassment of Parks.

[42] The Licensing Board in its May 3, 1985 decision on training found that licensee' management had now accepted their responsibility for the cheating.

However, the issue before the Commission is not whether GPU Nuclear has made mistakes, but whether GPU Nuclear as presently constituted and staffed has the necessary integrity to provide reasonable assurance that it will safely operate TMI-1. The Commission finds that it has. GPU Nuclear has now shown a determination to correct its errors and improve itself. The Commission notes in this regard GPU Nuclear's willingness to seek the views of independent evaluators,[43] to implement

[43] For instance, licensee contracted for the BETA and RHR Reports, see note 21, supra, for a review of its training programs by Data Design Laboratories ("Assessment of Selected TMI-1 Training Programs" (September 10, 1982)) ("1982 DDL Report"), and for an assessment by Admiral H.G. Rickover ("An Assessment of the GPU Nuclear Corporation Organization and Senior Management and its Competence to Operate TMI-1" (November 19, 1983)) ("Rickover Report"). Licensee has also been evaluated by the Institute of Nuclear Power Operations. These reports for the most part were generally favorable to licensee.

their recommendations,[44] and to add qualified outside expertise to tis staff.[45] Further, high-level management at GPU Nuclear has demonstrated a commitment to assure that a proper attitude is followed throughout the organization.[46]

Most importantly, there is no

[44] For instance, all but one of the original Operator Accelerated Retraining Program (OARP) Review Committee's recommendations on licensee's training program have been or are being implemented, all but two of the recommendations in the RHR report have been or are being implemented, and all but two of the recommendations in the BETA report have been addressed, either through implementation or disagreement.

[45] For instance, GPU Nuclear has expanded its Board of Directors to include three outside directors, who will also head a Nuclear Safety and Compliance Committee. See generally note 32 and accompanying text, supra.

[46] For instance, upper management in response to the cheating personally interviewed operators to ensure that the operators understood that cheating would not be tolerated, and upper management in response to the Parks incident has implemented policies to ensure that harassment does not recur.

persuasive evidence that any of the individuals in charge of GPU Nuclear have been personally implicated in wrongful acts. Indeed, the individuals currently responsible for the leadership of GPU Nuclear present an impressive array of credentials and experience. They are also responsible for the significant improvements made over the past performance of Metropolitan Edison Company.

The Commission finds that the present organization which will be responsible for operation of TMI-1 has demonstrated, both in personnel and in actions, that the past failings at TMI will not be repeated. In sum, after considering the personnel currently in charge of TMI-1 and the performance of GPU Nuclear, the Commission concludes that GPU Nuclear has the necessary competence and integrity to provide reasonable assurance of safe

operation of TMI-1. The Commission expects GPU Nuclear to recognize that the public as well as the NRC will be closely watching its future performance, and therefore to strive to achieve standards of excellence that will serve as a model for the industry. We will now turn to the two specific issues still pending in the restart proceeding.

B. Whether the Training Issue Raises Concerns Warranting Maintaining the Immediate Effectiveness of the Shutdown Orders

1. Background

a. Proceedings Through ALAB-772

One of the most important issues in the restart proceeding is whether the operators at TMI-1 are adequately trained. In its First Partial Initial Decision, the Licensing Board, after

reviewing the program, organization, and personnel devoted to training, concluded that "Licensee has in place at TMI-1 a comprehensive and acceptable training program". 14 NRC at 478.

After the Special Master examined the cheating incident, the Licensing Board in its Third Partial Initial Decision reevaluated the training program. The Licensing Board stated that it "remained convinced that the evidence supported the conclusion that Licensee's training program was well designed to train qualified operations and that there was a rational plan to implement the program." 16 NRC at 379. The Board was satisfied that licensee was devoting sufficient resources to its training program, and that licensee "cannot be faulted in the selection of the advice it sought for its training program, the credentials of its training managers or on the general design

of its training program." Id. The Licensing Board found that inadequacies in the administration of the training program resulted from a failure to apply the principles of quality assurance and quality control to the instruction and examination process, and did not represent a total program failure. The Licensing Board imposed four conditions aimed at ensuring adequate program implementation, which were to be satisfied by licensee within two years following any restart authorization.[47]

[47] Those four conditions were:

> (1) There shall be a two-year probationary period during which the Licensee' qualification and requalification testing and training program shall be subjected to an in-depth audit by independent auditors, approved by the Director of NRR, such auditors to have had no role in the TMI-1 restart proceedings.

The Appeal Board in ALAB-772 held that the Licensing Board had not developed an adequate record on the adequacy of the ----------.

> (2) Licensee shall establish criteria for qualifications of training instructors to ensure a high level of competence in instruction, including knowledge of subjects taught, skill in presentation of knowledge, and preparation, administration, and evaluation of examinations.
>
> (3) Licensee shall develop and implement an internal audition procedure, based on unscheduled ("surprise") direct observation of the training and testing program at the point of delivery, such audits to be conducted by the Manager of Training and the Supervisor of Operator Training and not delegated.
>
> (4) Licensee shall develop and implement a procedure for routine sampling and review of examination answers for evidence of cheating, using a review process approved by the NRC Staff."

16 NRC at 384.

The last three of these conditions have been implemented. Design Data Labs has been hired (and approved by staff) to do the in-depth audit required by the first condition. The probationary period has been incorporated as a licence condition.

training program in light of the cheating incidents. The Appeal Board found that "[t]he deficiencies in operator testing, as manifested by the cheating episodes, may be symptomatic of more extensive failures in licensee's overall training program. Whether those deficiencies still exist or have been sufficiently cured is not evident from the record." 19 NRC at 1233.

The Appeal Board held that the "principal difficulty" with the Licensing Board's decision was its failure adequately to reconsider in light of the cheating incidents its earlier finding that licensee's training program was "'comprehensive and acceptable.'" Id, quoting 14 NRC at 478. The Appeal board noted in this regard "that the generally positive testimony of the OARP Review Committee and licensee's other independent consultants was of decisional

significance" to the Licensing Board's initial favorable finding.[48] Id. at 1234. The Appeal Board noted that the OARP Review Committee prior to the cheating incidents had found "pre-accident neglect" of the TMI Training Department and identified shortcomings (such as bitterness and anxiety among some employees, inadequate training facilities, and the need for special teacher training for the instructors). Despite these criticism, the OARP Review Committee on balance gave the licensee's training program high marks. The Appeal Board believed that additional testimony was required from the OARP Review Committee regarding how it would now strike the

[48] The OARP Review Committee was comprised of five individuals with expertise in various aspects of training who are not affiliated with the licensee, although their compensation was paid by licensee.

balance between the positive and negative aspects of the program. The Appeal Board held that, "[o]nce the cheating incidents raised questions about that judgment, it was incumbent upon the Board to seek further testimony from the independent experts upon which it so heavily relied in the first instance." Id. The Appeal Board therefore reopened the record and directed the Licensing Board to take further evidence from the CARP Review Committee regarding the effect of the cheating incidents on its earlier favorable findings.[49]

b. The Licensing Board's Decision on Remand

The Licensing Board, following the

[49] In CLI-85-2, the Commission, noting that the evidentiary hearing on training had been completed, found that for public policy reasons the Licensing Board should proceed to issue its decision. 21 NRC 282.

lead of licensee and UCS, chose to interpret the Appeal Board's directive broadly. Thus, rather than limiting the hearing to the views of the OARP Review Committee, the Board considered the overall question of whether GPU Nuclear's licensed operator training program is adequate to prepare the TMI-1 licensed operators to operate the plant safely.[50]

The Licensing Board, after examining all the evidence before it,[51]

[50] Licensee chose to present testimony on the overall adequacy of its training program, and UCS challenged that overall adequacy. The Board explained as follows: "The Board agreed with the Staff that ALAB-772 did not remand this matter to litigate again the entire licensed-operator training program. Licensee and UCS, having elected a complete litigation, the Board followed them, because a complete case tended to bound the concerns of ALAB-772." Slip op. at 210

[51] Six groups of witnesses testified in the reopened hearings on training. Licensee presented four group, consisting of the panel of five experts who made up the Reconstituted OARP Review Committee,

concluded "that the Licensee has made an appropriate response to the 1981 cheating episodes and to the concerns of the Appeal Board in ALAB-772." Slip op. at 11-12. The Board found licensee's's response satisfied each of the following four essential elements: (1) management personnel have conceded their failures in connected with the cheating, have committed to prevent any recurrence, and have extensively improved communications between management and employees; (2) employee attitudes have improved; (3) examination security will prevent future cheating; and (4) the training program has been improved. The fourth element was the most extensively litigated, and received

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and three groups of licensee employees involved in the training program. Staff presented a panel of witnesses who testified regarding the methodology used by the Reconstituted OARP Committee to evaluate the training program. Finally, a UCS witness also testified regarding the methodology which should be used to evaluate a training program.

the most attention in the Board's decision.

The Licensing Board in reaching its decision examined the personnel in charge of the training program, management's response to the cheating, including employee attitudes, and the licensed-operator training program itself. The examination of the training program included an examination of program development and methodology, substance and execution, and program evaluation and feedback.

The Board found that the "licensed operator training program for TMI-1 is adequate to train reactor operators and senior reactor operators to operate the unit safely," slip op. at 214, with one proviso. That proviso was that the "training program needs improvement because it does not provide for the evaluation of its trained personnel in the

job setting for the purpose of validating and revising its training program." Slip op. at 154. To correct this deficiency, the Board imposed a condition requiring licensee to "implement a plan to evaluate the performance of trained reactor operators and senior reactor operators in the job setting for revision of its TMI-1 licensed-operator training program." Id. at 216. The Board, although it retained jurisdiction to review the terms of the license condition to be proposed by licensee, held that this plan did not need to be developed and approved prior to restart.[52]

Finally, the Board considered the impact of the views of the Reconstituted

[52] The Licensing Board had explained in its April 11, 1985 response to CLI-85-2 that "(f)ormal evaluation of operator performance in the job setting is almost by its very nature a function best performed after restart..." Slip op. at 8.

OARP Review Committee.

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The Reconstituted OARP Review Committee (Reconstituted Committee) conducted two reviews of licensee's training program. The first, which consisted of reviewing documents, interviewing training instructors, supervisors, and administrators, and inspecting training facilities, was conducted in response to the Appeal Board's decision in order to provide a Report to the Commission in connection with a then-upcoming meeting on whether to lift the effectiveness of the shutdown Orders. The Reconstituted Committee in its July 3, 1984 "Special Report of the Reconstituted OARP Review Committee" ("Special Report") responded to the Appeal Board's concerns "[w]ithin the limits of time and resources available." Special Report at 5. The Reconstituted Committee stated in that Special Report that the cheating incidents "were extremely serious and reflect unfavorably on the organizations as well as the individuals involved." Id. at 5. Nonetheless, the conclusions of the Reconstituted Committee were favorable.

The Reconstituted Committee conducted a further review of the training program in order to prepare its testimony. In that review, the Reconstituted Committee reviewed pertinent documentation, interviewed personnel, observed training sessions, and visited relevant facilities. The Reconstituted Committee in their testimony discussed, among other things, licensee's training resources and management, the training staff, instructor development, licensed operator training programs and procedures, and communications between management, training and operations personnel. The Committee also discussed the specific

The Board could not find from the substance of Committee's review alone that the Committee's ultimate conclusion -- that the program was adequate to produce individuals competent to operate TMI-1 -- was either correct or incorrect. However, the Licensing Board did find that the Committee satisfied the remanded order in ALAB-772, in that the Committee "provided its very carefully constructed and well-founded opinions on the basic issue and various subsidiary evidentiary

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subissues raised by the intervenors.

The Committee, recognizing that its earlier Special Report had been limited by time constraints, explained that, subsequent to that Report, each member had spent as much time as he had available to further reviewing licensee's training program to provide assurance that the conclusions reached in the Special Report were correct. The Committee concluded as follows: "[I]t is the Committee's judgment that the licensed operator training program at TMI-1 is an effective program and will continue to qualify individuals to operate TMI-1. The Committee thus takes this opportunity to reaffirm the conclusions reached in the Special Report..."

questions just as the Appeal Board requested." Slip op. at 211. Therefore, the Board, rather than attempting to separate the Committee's findings and testimony from the other evidence, simply used those findings in conjunction with other evidence in analyzing each issue regarding licensee's training program.[54] The Board in this regard noted the very high value it placed on the Committee members' opinions.

c. Analysis

The concerns about licensee's training program which led in part to making the 1979 shutdown Orders immediately effective were based on the

[54] The Licensing Board also addressed the impact of INPO's accreditation of licensee's training program. As the Board did not rely on this accreditation in its decision, that accreditation need not be further addressed here.

apparent deficiencies in licensee's pre-accident training program. Licensee's current training program, as extensively described by the Licensing Board, bears little resemblance to that pre-accident program.

There have now been three hearings which have considered the adequacy of GPU Nuclear's licensed operator training program. The Licensing Board found that licensee's improvements to its training program over this time period have been significant. Licensee has substantially improved the licensed operator training staff for TMI-1,[55]

[55] As summarized by the Licensing Board:

> In 1981, it [the licensed operator training staff] consisted of one supervisor and two instructors, who were SRO-licensed. Two contractor-supplied personnel also were assigned. None of these

upgraded the training facilities

> individuals held degrees.... Today, manpower in the Operator Training section devoted to TMI-1 licensed operator training consists of one manager, one administrative assistant, two staff positions (both with responsibilities as instructors), one supervisor, and three instructors (one of whom is assigned as Supervisor of Non-licensed Operator Training). Of the six persons designated to conduct licensed operator training, four have been licensed or certified as senior reactor operators. Three of these licenses are current; the other is not, but that instructor is now requalifying for a current SRO license.... The combined nuclear power plant experience of the staff is forty-eight years, of which twenty-five years are commercial. The combined instructor experience for the Operator Training staff is twenty-nine years, of which twenty-two years are in the nuclear field. Five of the staff hold bachelor's degrees; one of these has a master's degree as well.

Slip op. at 22. In addition, there is now a separate Simulator Development Section of the Training Department that consists of one manager and three instructors. See Slip op. at 29.

and support equipment,[56] and changed the training program "from a traditional, knowledge-based program that depended heavily upon the prior knowledge of the instructors to a very modern, structured, performance-based program."[57] Slip op. at 13.

[56] "An upgrading of training facilities and support equipment has been in progress since 1980. The majority of classroom training for licensed operators now takes place in a modern, 20,000 square-foot training center built for this purpose and first occupied in mid 1981. The center, used entirely for training purposes, has fifteen classrooms (two of which can be combined into an auditorium). It houses the Basic Principles Training Simulator (BPTS) and its support equipment, a control room mockup, office space for a training staff of 62, a library, file room, audio-visual equipment room, conference room and photocopy, vending machine, storage and rest room area.... A new, identically sized building has been designed with construction to begin in the spring of 1985. This building will house the BPTS and the new replica simulator (under construction), the Communications Division, and will provide more instructor work area." Slip op. at 31.

[57] The credit for this improvement

The question facing the Commission, then, is whether, after three exhaustive hearings and a Licensing Board decision favorable to licensee,[58] there are still concerns about licensee's licensed operator training program which warrant maintaining the effectiveness of the shutdown Orders. In light of the depth of examination given licensee's training program and the Licensing Board's favorable findings, the answer to this

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must be given to the managers now in charge of licensee's training program. See Slip op. at 75-76.

[58] Concerning the one deficiency found by the Licensing Board, the Commission agrees that job performance evaluations are best performed after a plant goes into operation, and that this condition need not be met prior to restart. See LBP-85-10, 21 NRC____(1985). With regard to whether reasonable progress has been made on this item, the Board stated that licensee would demonstrate reasonable progress if it began immediately to satisfy the requirement. Under the terms of the Board's decision, this is sufficient to demonstrate reasonable progress.

question is favorable to restart. The Commission finds that there are no concerns about the adequacy of GPU Nuclear's training program which would warrant maintaining the immediate effectiveness of the shutdown Orders during the agency's appellate review of the Licensing Board's decision.[59]

[59] On May 22, 1985, TMIA moved the Commission to reopen the record. TMIA claimed that it had just discovered another instance of cheating by Floyd in 1979, and that licensee's failure to produce this information during the hearings undermine the Licensing Board's conclusion in its May 3, 1985 Partial Initial Decision on training that licensee's managers have acknowledged their failures and their responsibility to prevent cheating.

The Licensing Board's May 3, 1985 decision has been appealed to the Appeal Board. Accordingly, that Board is the appropriate one initially to consider TMIA's motion. That motion is therefore hereby referred to the Appeal Board.

The Commission has nonetheless considered whether the pendency of that motion should impact on today's decision. The Commission has decided that it should not. First, licensee identified this incident to the Commission and parties on June 1, 1984, nearly one year before TMIA

C. Whether the Dieckamp Mailgram Issue Raises Concerns Which Warrant Maintaining the Immediate Effectiveness of the Shutdown Orders

1. Background

On May 7, 1979 Congressman Udall, then-Commissioner Gilinsky and others toured Three Mile Island. James Floyd, who was at that time TMI-2 Supervisor of

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chose to file its motion to reopen. TMIA's motion therefore appears to be untimely, and should not cause any further delay in making today's decision.

More importantly, the adequacy of licensee's current training program has been litigated and found to be acceptable. The consideration of the current training program specifically included whether adequate remedial stops had been taken in response to earlier cheating. One more example of earlier cheating would be redundant and of minimal significance.

With regard to the assertion that licensee withheld the information, the Commission need only note that licensee itself identified this information one year ago.

The Commission therefore concludes that the pendency of this motion to reopen does not raise concerns which would warrant maintaining the effectiveness of the shutdown Orders.

Operations, conducted the tour of the TMI-2 control room. Mr. Floyd during that tour stated that on the first day of the accident a pressure spike[60] occurred which initiated the containment building spray. He asserted that the spike had been observed by licensee personnel and an NRC inspector.

On May 8, 1979, the New York Times published an article describing Mr. Floyd's presentation. The paper stated that Mr. Floyd asserted that control room personnel and NRC inspectors knew the plant's fuel core was seriously damaged two days before the damage was formally reported and the seriousness of the accident made public.

[60] The "pressure strike" refers to the sudden increase in containment pressure during the accident from about 3 to 28 psig, followed by a rapid decrease to 4 psig. This spoke was due to the burning or explosion of hydrogen, which is symptomatic of core damage.

Herman Dieckamp, GPUN President, on May 9 sent a mailgram to Congressman Udall with a copy to then-Commissioner Gilinsky. That mailgram stated, in pertinent part, "There is no evidence that anyone interpreted the 'pressure spike' and the spray initiation in terms of reactor core damage at the time of the spike nor that anyone withheld any information."

In the original management hearings neither the parties nor the Licensing Board pursued whether Dieckamp told the truth in the mailgram. Instead the Licensing Board relied on the NRC's Office of Inspection and Enforcement (IE) investigation and testimony to conclude that Mr. Dieckamp had not made a material false statement, and that Mr. Dieckamp believed the statement to be true when he made it. 14 NRC at 555-56.

In ALAB-772, supra, the Appeal Board found the Licensing Board's reliance on

IE's investigatory report unjustified because of the conclusory nature of that document. The Appeal Board noted that no party had actively pursued this issue and that no party had chosen to cross-examine Mr. Dieckamp on the mailgram when he testified in the proceeding. Nonetheless, it held that the Licensing Board erred in not pursuing the matter more fully. Although the Appeal Board noted that it was not suggesting any wrongdoing by Mr. Dieckamp, and that further hearings might not be very fruitful because memories fade after five years, it remanded the matter to the Licensing Board for further hearings in order not to "leave it dangling." 19 NRC at 1268.

On February 25, 1985, the Commission found as a matter of public policy that the Licensing Board should issue a decision on the Dieckamp mailgram issue. The Commission in that Order noted that

Mr. Dieckamp continues to hold a high-level position with licensee's parent organization, and that hearings would resolve any "lingering questions." CLI-85-2, 21 NRC 282, 289 (1985).

2. Analysis

The Commission has given considerable thought to whether it should wait for the Licensing Board to issue its decision on the mailgram issue before making its decision as to whether to lift the immediate effectiveness of the shutdown Orders. The Commission has determined that the mailgram issue does not raise health and safety concerns that would warrant maintaining the immediate effectiveness of the shutdown Orders.

Mr. Dieckamp is no longer President of GPU Nuclear and is not involved in the daily operations at TMI-1. Although he continues to serve on the Board of Directors of GPU Nuclear, in that position

he does not have day-to-day responsibility for the safe operation of the facility. Executive management responsibility is vested in Messrs. Clark, Kintner, and O'Leary, none of whom were at GPU at the time of the accident. Moreover, these individuals have direct access to the parent Board of Directors of GPU for matters of safety and budget without going through Mr. Dieckamp in his role as President of GPU. We do not believe that under the present organizational structure and procedures, including provision for independent oversight of nuclear safety, Mr. Dieckamp's present as President of GPU and as a Board member of GPUN could adversely affect the safe operation of TMI-1, especially for the short period before the Licensing Board renders a decision.

We further emphasize that in ordering further hearings the Appeal Board did not

find that Mr. Dieckamp had probably engaged in wrongdoing. Rather, the Appeal Board wanted to resolve any lingering suspicions. If the Licensing Board should determine that Mr. Dieckamp has engaged in wrongdoing, the Commission will take appropriate action. However, options to be considered in that event would not include shutting down the facility.

D. Procedural Issues

1. Applicable Standards for an Effectiveness Decision

UCS argues that this proceeding is no longer an enforcement proceeding where the issue would be whether to lift the immediate effectiveness of the shutdown orders. UCS contends instead that, because the Licensing Board has imposed license conditions, it is a license amendment proceedings. UCS therefore concludes that the standards in 10 CFR

2.764 or 2.204 for making a Licensing Board decision immediately effective should apply, and that these regulations do not allow the Commission to make an "immediate effectiveness" decision where the controlling decision -- the Appeal Board's decision in ALAB-772 to reopen the record -- is not favorable to operation.

The Commission does not agree with UCS. That the Licensing Board has imposed license conditions does not convert this proceeding into a license amendment proceeding. Once the Commission establishes a formal adjudicatory hearing in an enforcement case, as it did here, it need not grant separate hearings on any license conditions that are imposed as a direct consequence of that enforcement hearing. The UCS logic would lead to a situation in which every condition or qualification on operation suggested in an enforcement hearing would have to be

recycled through an array of separate additional hearings.[61]

Therefore this remains an enforcement proceeding, and neither 10 CFR 2.764 or 2.204 are applicable.[62]

[61] Nor would restart itself constitute a license amendment, as UCS contends. Restart involves lifting a suspension, and hence does not create new hearing rights. See, e.g., San Luis Obispo Mothers for Peace v. NRC, 751 F.2d 1287, 1314 (D.C. Cir. 1984); Sacramento Municipal Utility District (Rancho Seco Nuclear Generating Station), CLI-79-7, 9 NRC 680, aff'd Friends of the Earth v. United States, 600 F.2d 753 (9th Cir. 1979); Public Service Co. of Indiana (Marble Hill Nuclear Generating Station), CLI-80-10, 11 NRC 438 (1980), aff'd Save the Valley v. NRC, 714 F.2d 142 (6th Cir. 1983) (Table).

[62] 10 CFR 2.204, which provides that the Commission shall make a license amendment immediately effective upon finding that the public health, safety, or interest so requires, applies only when the Commission makes the determination to make a license amendment effective without affording an opportunity for a prior hearing. Here an exhaustive hearing has already been held on possible amendments to the license, and since additional amendments would be imposed or granted only as a result of a prior hearing, 10 CFR 2.204 does not apply.

10 CFR 2.764(f)(2) is similarly

Rather, the standard for determining whether to lift the immediate effectiveness of

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inapplicable. 10 CFR 2.764(f)(2)(i) provides that the Commission shall make a Licensing Board decision authorizing a unit to operate at full power immediately effective "if it determines that it is in the public interest to do so, based on a consideration of the gravity of the substantive issue, the likelihood that it has been resolved incorrectly below, the degree to which correct resolution of the issue would be prejudiced by operation pending review, and other relevant public interest factors." The standards in 10 CFR 2.764(f)(2) apply only to initial licensing decisions. TMI-1 received an operating license in 1974, and a decision to allow restart of TMI-1 would reinstate licensee's rights under that operating license. That license conditions have been imposed as a result of the hearing process does not convert this enforcement proceeding into a licensing action such that 10 CFR 2.764 would apply, as any enforcement proceeding can lead to license conditions.

an enforcement order is whether the concerns which led to making that order immediately effective have been adequately resolved. Once this has been done, the Commission is legally obligated to lift the immediate effectiveness of the order, regardless of the nature of the latest Board decision.[63] As the Commission explained in an earlier order:

> Here, a decision by the Commission rather than granting effectiveness to a Licensing Board decision, would be determining, based on that decision and other factors, whether the concerns which prompted its original immediate suspension order of August, 1979, justify a continuation of that suspension. If they do not, and the Commission therefore can no longer find that the "public health, safety and interest" mandates the

[63] The Aamodts on October 27, 1983 requested the Commission to revoke GPU Nuclear's license to operate TMI-1. For reasons set forth in this Order the Commission has denied that request.

> suspension, then the Commission is required by law -- whatever the nature of the Licensing Board's's decision -- to lift that suspension immediately. This is a matter peculiarly within the Commission's knowledge and involving the most discretionary aspects of its enforcement authority.

CLI-81-34, 14 NRC 1097 (1981).

2. Whether the Commission Can Base its Effectiveness Decision in Part on Information Outside the Formal Adjudicatory Record

UCS, TMIA and the Aamodt argue that the Commission must base its decision whether to lift the immediate effectiveness of the shutdown Orders on the formal adjudicatory record. They argue that the Commission's regulations do not authorize consideration of off-the-record material and that such consideration denies them the fundamental right of cross examination.

The Commission's decision today is

based entirely on the formal record of the proceeding.[64] The Commission therefore need not address this argument.

3. Legal Effect of ALAB-772 on Lifting Immediate Effectiveness]

UCS argues that the Commission cannot lift the effectiveness of the shutdown Orders because its earlier orders establish that the Commission may not order restart unless the Boards' decisions are favorable to restart. Similarly, UCS maintains that this is no longer a case of lifting the immediate effectiveness of a shutdown order, because licensee has had a

64 As explained supra, the formal record includes information presented in motions to reopen the record and non-disputable matters such as personnel changes. It also includes the fact that GPUN has taken various corrective steps, such as commissioning independent reviews. See note 43, supra. The substantive conclusions of these reports were not litigated, however, and accordingly are not considered in today's decision.

hearing and failed to prevail. Hence, UCS concludes, restart cannot be authorized unless and until the Licensing Board finds in licensee's favor on all issues.

The Licensing Board has now found in licensee's favor on all but one issue, the Dieckamp mailgram, which remains pending before the Board. Hence the UCS arguments are moot except for that issue.

The Commission already has concluded that the mailgram issue does not raise health and safety concerns that warrant maintaining the immediately effective shutdown Orders. Clearly the Commission is not legally bound to wait for a Licensing Board decision on such an issue prior to lifting the immediate effectiveness of the shutdown Orders. The Appeal Board did not find against licensee; rather, the Appeal Board found the evidentiary record inadequate to resolve one way or the other whether Mr. Dieckamp engaged in any

wrongdoing. TMI-1 is shut down, then, not because of the Appeal Board's decision, but because of the immediately effective shutdown Orders. The UCS argument that licensee has had a hearing and failed to prevail is therefore without merit.

Concerning whether the Commission has bound itself to await a final Licensing Board decision, no matter how insignificant the issue for safe operation of TMI-1, the Commission in the August 9, 1979 Order establishing the restart proceeding stated that, "[i]f the Licensing Board should issue a decision authorizing [restart]..., the Commission will ... decid[e] whether the provision of this order requiring the licensee to remain shut down shall remain immediately effective." 10 NRC at 149. See also CLI-81-19, 14 NRC 304, 305 (1981); Order of March 10, 1982 (Unpublished); Order of July 2, 1979 (Unpublished).

The Commission subsequently stated, however, that if the public health, safety and interest no longer require the suspension, "then the Commission is required by law -- whatever the nature of the Licensing Board decision -- to lift that suspension immediately". CLI-81-34, 14 NRC 1097, 1098 (1981). Hence the Commission has put the parties on notice that the entire hearings and decision process did not necessarily have to be completed before an effectiveness decision.

Even if the Commission had not put the parties on notice, moreover, the change in circumstances since this proceeding begin in 1979 would justify the course chosen in this order. When the Commission originally contemplated that it would consider restart only if the Licensing Board's decision were favorable, it did not envision that the proceeding

would last over five years[65] or that only one issue not significant for safe plant operation would remain before the Licensing Board, and that after an appellate remand. The Commission cannot ignore its legal obligation to lift the immediate effectiveness of a shutdown order once the concerns which led to making that order immediately effective are satisfied, even if a single issue not significant for safe plant operation remains pending before the Licensing Board. See, e.g., Sacramento Municipal Utility District (Rancho Seco Nuclear Generating Station, CLI-79-7, 9 NRC 680 (1979) (resumption operation authorized prior to hearing); see also ICC v. Oregon Pacific Industries, 420 U.S. 121, 127

[65] The Commission in its August 9, 1979 Order suggested a tentative schedule for the restart proceeding under which the Licensing Board would have issued its decision in slightly under one year. 10 NRC at 152.

(1975) (Powell, J., concurring); Pan American Airways v. C.A.B., 684 F.2d 31 (D.C. Cir. 1982); Northwest Airlines, Inc. v. Civil Aeronautics Board, 539 F.2d 748 (D.C> Cir. 1976); Airlines Pilots Ass'n, International v. C.A.B., 458 F.2d 846 (D.C. Cir.), cert denied, 420 U.S. 972 (1975). Hence the pendency of the mailgram issue before the Licensing Board does not preclude the Commission from lifting the immediate effectiveness of the shutdown Orders.

E. Staff's Proposal of a 25% Power Limitation and Round-the-Clock NRC Inspection

The NRC staff at one time proposed limiting the power level to 25%, with operation beyond 25% depending "upon the functioning of the GPUN Nuclear Safety and Compliance Committee, a Staff report on plant operations at 25% of power with no

major safety problems having been identified, and an evaluation of the GPU operational QA ([quality assurance] coverage." Staff also would require round-the-clock NRC inspection, "at least until the licensee's operationa QA coverage and the Nuclear Safety and Compliance Committee of the licensee's Board of Directors are solidly in place and functioning." These conditions were apparently originally based on concerns both about the integrity of those who will be operating TMI-1 and about the effect of six years of non-operation on plant systems and personnel. Although staff has not repeated this proposal in recent filings, the Commission has decided that it warrants some discussion.

The licensee, UCS, and the Aamodts commented specifically on staff's proposed conditions. Licensee stated that a temporary limit of 40-45% of full power

would be more meaningful in terms of plant conditions and operator experience than the 25% proposed by staff.

UCS argued that the staff's goals in limiting operation to 25% power can be achieved at 5% power, and that an accident at 25% could result in releast of radiation beyond the limits permitted by 10 CFR Part 100. Hence UCS concluded that a 25% power limit is unsupported.

The Aamodts maintained that round-the-clock NRC inspection would be inadequate because of the NRC's lack of specific knowledge of how TMI-1 operates and because such a "policing action by NRC is not an acceptable alternative to a competent and trustworthy management or experienced and trained operators." The Aamodts also questioned the competence and integrity of NRC inspectors, and noted that NRC surveillance would create practical and legal problems concerning

who had responsiblity for operating the plant.

The Commission has determined that the management concerns which led to making the 1979 shutdown Orders immediately effective have been resolved adequately, and hence that GPU Nuclear has the required competence and integrity to operate TMI-1 safely pending completion of further proceedings. Therefore, the Commission has decided not to impose on licensee for integrity reasons either of staff's proposed conditions.

However, the Commission notes that TMI-1 has been shut down for over six years. The Commission believes because of this consideration alone that the power level should be raised gradually to ensure that all components of the facility still function properly, and that there is an adequate opportunity to operate the plant at low power levels. Accordingly, to

ensure a safe return to operation, the Commission directs the licensee to submit a power ascension schedule, with hold points as necessary at appropriate power levels, to the NRC staff for its approval prior to restart. Licensee is not to restart TMI-1 until the staff has approved the proposed power ascension schedule.

Furthermore, because the facility has not operated for six years, the Commission has determined that licensee's performance during the period of start-up and power ascension, beginning with initial criticality, should be carefully monitored and thoroughly evaluated. During this time period, and any time period thereafter staff feels to be appropriate, the staff is to provide more oversight to TMI-1 than it would normally given an operating reactor. The NRC staff is to develop the oversight program and is to provide a general description of it to the

Commission for its information prior to restart.[66]

The Commission is also directing the staff to prepare combined Performance Appraisal Team (PAT) inspections and Systematic Appraisal of Licensee Performance (SALP) inspections at the end of six months of operation and again at the twelve-month mark. These reports will address areas such as plant operations, maintenance, licensed and non-licensed operator training, quality assurance, radiological controls, fire protection, emergency preparedness, security and safeguards and design, engineering and

[66] The increased NRC oversight and power ascension programs are not being imposed because of any contested issues in the proceeding; they are being imposed because the plant has been shut down for over 6 years. Therefore, it is permissible for the Commission to allow the staff to approve these programs, without the participation of the other parties.

plant modifications. The combined PAT/SALP reports are to be provided to the Commission and the public.

F. Summary of Effectiveness Decision

The law requires the Commission to lift the immediate effectiveness of the shutdown Orders once the concerns which led to making those Orders immediately effective are satisfied. After a full agency appellate review, all but two issues in the restart proceeding have been resolved favorably to resumed operation of TMI-1. While one of those issues remains pending before the Licensing Board, the other has been resolved favorably by that Board. The Commission has now determined that any remaining concerns about those two issues do not warrant maintaining the effectiveness of the shutdown Orders. Accordingly, the Commission must lift the immediate effectiveness of the shutdown

Orders. This decision authorizes TMI-1 to restart, subject to satisfactory completion of the conditions imposed in this order.

IV. Discussion of Other Issues

As noted earlier, the Commission has decided because of the unique nature of this proceeding also to discuss several other concerns raised by members of the public which fall outside the scope of the restart proceeding.

The prospect that TMI-1 may be restarted has evoked a great deal of concern on the part of many residents of the surrounding communities. Most of the written comments and oral statements addressed to the Commission at a November 9, 1982 public meeting in the Harrisburg, Pennsylvania area were opposed to restart. Many of those opposed were greatly concerned for their own safety and the safety of their families. We

recognize that those concerned look to us to safeguard their interests and we are confident that the basis for their concerns about the safety of this plant have been resolved.

Members of the public raised three general concerns that warrant comment here: (1) whether the results of public referenda[67] against allowing restart should prevent restart; (2) whether TMI-1 should remain shut down until Unit 2 is cleaned up; and (3) whether this decision to lift the immediate effectiveness of the shutdown Orders reflects a choice of economics over public safety.

With regard to the first issue, the Commission believes that such referenda provide a valuable indication of public

[67] On May 18, 1982, Dauphin, Cumberland, and Lebanon Counties held a non-binding referendum on the restart of TMI-1. The majority of the votes cast in all three counties opposed restart.

concern. Even though such concerns are ordinarily transmitted and translated into government action through legislation enacted by elected legislative bodies, the Commission has given careful consideration to the public's concerns regarding this matter. To alleviate at least some of the public's concerns, the Commission has attempted to explain fully the basis for its decision today. The fact remains, however, that the NRC is not a legislative body and it lacks discretion to act on the basis of issues that are not within the scope of the laws established by Congress. In the Atomic Energy Act, Congress has directed the NRC to make decisions regarding the licensing of nuclear reactors, such as this one, on the basis of its own expert judgment and analysis of whether the detailed regulatory requirements of the Commission have been satisfied. While we are aware of the

sentiment of many members of the public against restart, we are convinced there is reasonable assurance that this plant will be safely operated. Hence we must make our decision to authorize this plant to resume operation.

With regard to the second issue, the cleanup of TMI-2, many commenters believed that cleanup should be completed prior to any decision to restart TMi-1. The Commonwealth of Pennsylvania opposed restart until adequate funding has been assured to complete the cleanup. The Commonwealth also asserted that the cleanup activities may pose a threat to the safe operation of Unit 1 and argued that restart should be postponed until questions regarding the wisdom and safety of operating Unit 1 next to the damaged Unit 2 have been answered.

The Commission for some time has been concerned about the pace of the cleanup

efforts and in many forums has advocated that cleanup be conducted on an expedited basis. Recently there has been substantial progress both in securing cleanup funds and in the cleanup itself. The Commission set forth its views on the present status of the cleanup and funding for the cleanup in an information notice on March 6, 1985 (50 Fed. Reg. 9143). The Commission's views are summarized below.

The funding for the cleanup as proposed by Pennsylvania Governor Richard Thornburgh -- the Thornburgh Plan -- provides that funding will come from the utility industry, ratepayers, and the federal and state governments. While the ratepayers and federal and state governments have contributed funds to the cleanup for several years, no monies were forthcoming from the industry prior to December 1984 due to a requirement by Edison Electric Institute (EEI) that $100

million be pledged before any money is actually contributed.

The Commission was becoming increasingly concerned in view of these events over both the pact of the cleanup and the possibility that funding shortfalls might slow down that effort even further. Accordingly, the Commission in June 1984 directed the NRC staff to explore means to expedite the cleanup effort, including alternative methods to accomplish the cleanup, as well as actions that would compel the licensee to complete specific cleanup milestones by specified dates.

Several significant events occurred while this effort was underway. EEI lifted the requirement that $100 million be pledged before any money could be contributed, and informed the Commission in a letter dated September 5, 1984, that beginning in 1985 for a period of six

years EEI members will contribute $25 million annually to the cleanup of TMI-2, for a total of $150 million. To ensure that this annual $25 million contribution is met, Pennsylvania and New Jersey electric utilities have agreed to make up any shortfall by providing research and development grants each year to the extent necessary to maintain an annual funding level of $25 million per year for this program. Hence the industry's share of the cleanup funds (amounting to $25 million per year for six years) is now as reasonably assured as the other sources of funding.[68]

Further, in late 1983 the upper GPUN management structure responsible for the cleanup began to change and a new management team began to be assembled.

[68] The first payment of $10.9 million from EEI was provided to GPUN on December 28, 1984

Progress in the cleanup began to improve, and in February 1984 the polar crane load test was conducted. Five months later the reactor pressure vessel head was removed, which constitutes a significant milestone in the progress of the cleanup. Licensee's management has now publicly committed to accelerate the early steps of the cleanup with the goal of conforming by the end of 1986 to the milestones identified in its December 1982 schedule.

The Commission in its August 9, 1979 Order directed the Licensing Board to address whether decontamination operations at TMI-2 would affect safe operation of TMI-1. The Licensing Board in its Second Partial Initial Decision held that, subject to licensee's compliance with four conditions, it was satisfied that Units 1 and 2 were sufficiently separated so that the cleanup of Unit 2 should not interfere with the safe operation of Unit 1. No

party to the proceeding, including the Commonwealth, appealed those findings.

The Commonwealth in its comments noted that after the Licensing Board issued its findings the Commission advised the Chairman of the Senate Subcommittee on Nuclear Regulation, Committee on Environment and Public Works, in a letter dated March 22, 1982, that "the potential for slow degradation of containment integrity and equipment capability plus the increasing concern for an unexpected release of radioactive material" argued for a more aggressive and expeditious TMI-2 cleanup program. In that letter the Commission also raised the issue of the increased possibility of accidents involving radiation leaking and subsequent exposure to workers and the public as the TMI-2 equipment deteriorates. The Commonwealth argued that the possibility of these events raises questions about the

ability of the licensee to keep Unit 2 in a safe configuration.

The NRC staff has continued to monitor closely the condition of the TMI-2 reactor for indications of equipment deterioration which could pose threats to public health and safety.[69] The Commission finds that the plant has continued to be maintained in a safe configuration and agrees with the Licensing Board that the condition of TMI-2 or its cleanup should not pose a threat to the safe operation of Unit 1, because of the nearly complete separation of units. If for some reason the situation at TMI-2 unexpectedly were to deteriorate, the Commission would take prompt action regarding TMI-1 to prevent

[69] For example, the NRC staff has established an office at Three Mile Island which is manned by eleven professional. A major function of that office is to monitor the status of TMI-2 plant conditions.

any harm to public health and safety, including shutting down Unit 1, if necessary. As long as TMI-2 remains in a safe configuration, we do not believe ongoing TMI-2 cleanup activities should bar the restart of TMI-1.

Finally, this decision to lift the immediate effectiveness of the original shutdown Orders does not reflect a choice of economics over safety. The Commission has kept TMI-1 shut down for nearly six years while hearings have proceeded on the concerns which caused the Commission to issue the shutdown Orders. The sole issue in determining whether to lift those shutdown Orders is whether the original safety concerns have been resolved adequately. Economics plays no role in that determination. After an extensive adjudicatory hearing, one issue (training) remains pending before the agency on appellate review, and one (mailgram)

remains pending before the Licensing Board. The Commission in this decision has fully addressed the significance of those two issues. The Commission finds there is reasonable assurance of the protection of the public health and safety, and, accordingly, must lift the immediate effectiveness of the shutdown Orders.

V. Conclusion

All but two issues in the restart proceeding -- training and the Dieckamp mailgram -- have been resolved after full agency appellate review. The Commission finds that the concerns regarding these two issues have been resolved sufficiently to require lifting the immediate effectiveness of the 1979 shutdown Orders.

In sum, the Commission has found that GPU Nuclear, the current licensee at TMI-1, represents a significantly improved organization over Metropolitan Edison

Company in terms of personnel, organizational structure, procedures, and resources. The Commission is satisfied that the pre-accident faults at TMI have been corrected such that there is reasonable assurance that TMI-1 can and will be safely operated. The Commission also finds that none of the other concerns raised outside of this proceeding warrant separate enforcement action to keep TMI-1 shut down. Accordingly, the Commission is lifting the immediate effectiveness of the shutdown Orders. However, because TMI-1 has been shut down for over six years, the Commission is imposing the following two conditions:[70]

1. To ensure a safe return to operation,

[70] Staff on May 29, 1985 certified that all other conditions required to be met prior to restart had been met.

licensee is to submit a power ascension schedule, with hold points as necessary at appropriate power levels, to the NRC staff for staff's approval. The plant cannot be restarted prior to staff approval of such a schedule; and

2. The NRC staff prior to restart is to provide to the Commission for its information a general description of a program to provide increased NRC oversight at TMI-1 during the period of start-up and power ascension, beginning with initial criticality, and any time period thereafter staff feels to be appropriate.

Commissioner Asselstine dissents from this Order. His dissenting views are attached. As reflected in his attached separate views, Commissioner Bernthal disagrees, as a policy matter, with this Order only insofar as it indicates that further hearings are not warranted. The

additional views of Chairman Palladino and statements of Commissioner Roberts and Commissioner Zech are also attached.

It is so ORDERED.[71]

[71] TMIA, on May 20, 1985, filed a motion requesting the Commission "to stay its order of May 29, 1985, which will authorize the restart of Three Mile Island, Unit 1." In the alternative, TMIA requested a stay of two weeks to permit it the necessary time to seek an emergency stay from the courts. Licensee and the NRC staff opposed TMIA's request. UCS on May 28 also filed a stay motion.

The TMIA and UCS requests to stay the Commission's decision were filed prematurely. The Commission therefore could have simply rejected them. However, because of the controversy surrounding the restart of TMI-1, the Commission has considered these requests.

The Commission disagrees with the arguments that the standards for grant of a stay are satisfied. For the reasons set out in this and other Commission orders, TMIA and UCS have not made a strong showing that they are likely to prevail on the merits. The one issue raised by UCS that is not addressed in this or another order is that UCS is entitled to comment on staff's certification regarding environmental qualification of electrical equipment. Certification is a matter outside the proceeding, and therefore UCS is unlikely to prevail on the merits of this claim. Moreover, neither TMIA nor UCS has demonstrated any irreparable

injury, and the grant of a stay would have a significant adverse impact on others. Finally, the Commission finds that the public interest does not lie in the grant of a stay.

Licensee in response to the TMIA motion stated that each month's delay in returning to operation will cost licensee's ratepayers $6.7 million in increased costs, that licensee's nonresidential customers will continue to suffer competitive disadvantages, that GPU common stockholder will suffer an approximately $5 million reduction in earnings, and the TMI-1 owners' ability to fund excess advances to the TMI-2 cleanup will be impaired. Clearly this is a significant adverse impact on licensee and others. Moreover, ascension to full power is a gradual process, and the public health and safety risks at low levels of power are far less than the theoretical, but fully acceptable, risks of full-power operation. The Commission in this Order is requiring that licensee submit a power ascension schedule with appropriate hold points, and licensee in response to TMIA's motion stated that "not until the sixth day after a Commission restart order does Licensee intend to take TMI-1 critical,...[and a] full 10 days will elapse before the plant even reaches and passes through the 5% power level." Licensee further stated that it would be a minimum of 99 days before TMI-1 begins sustained full-power operation. The plant therefore will be operated at relatively low power levels for several weeks. Moreover, as an extra measure of caution, the NRC staff will be providing increased NRC oversight of TMI-1 during its start up and initial operation. Under the circumstances, the Commission finds that the standards for a stay have not been met.

However, the Commission recognizes that the parties to this proceeding likely will seek to stay today's decision in the courts. Therefore, to afford the parties to this proceeding an opportunity to seek judicial relief, it they so desire, the Commission has decided that TMI-1 cannot be returned to initial criticality until the later of the following:

(1) The conditions imposed in this order are met, and the license conditions imposed in this proceeding to date are formally included in the TMI-1 license; or

(2) no party to this proceeding has sought a judicial stay of this decision by June 3 at 5:00 p.m. If a judicial stay is sought by June 3, then in order to allow time for responses to the court and a court decision, TMI-1 cannot be returned to initial criticality until noon on June 11.

DISSENTING VIEWS OF COMMISSIONER ASSELSTINE

One reason for the Commission's 1979 decision to shutdown TMI-1 was that the Commission had questions about the management capabilities of Metropolitan Edison (predecessor to GPU Nuclear). The utility had, after all, presided over the worst accident ever at a commercial nuclear reactor in this country. The Commission set up a Licensing Board to hear the evidence and decide whether GPUN had the requisite corporate character and competence to be permitted to operate TMI-1. The Licensing Board's conclusion was favorable, but in the years since the accident, new evidence has come to light repeatedly which cast continued doubt on GPUN's competence and integrity. This is one reason this proceeding has lasted for

six years.[1] In its order today, the Commission heaves a sigh of relief and concludes that all questions about the management capacilities of GPUN have been satisfactorily answered and that GPUN may be permitted to restart TMI-1. I cannot agree with the Commission's conclusion.

The Commission has managed to identify the primary question which must be answered -- Does the licensee exhibit the corporate integrity necessary for the Commission to be confident that the licensee will operate the plant safely? Unfortunately, the Commission's decisionmaking process has not been able to produce a dispositive answer to that question. This is primarily because the Commission has either ignored or

[1] Another reason is that in 1981 the primary coolant water was contaminated with a corrosive agent (thiosulfate) resulting in extensive damage tc the TMI-1 steam generators and requiring novel and time-consuming repairs which have only recently been completed.

discounted important issues, and because the Commission's approach to the management integrity issue since the end of the Licensing Board proceeding in 1981 has been a piecemeal one. Each time evidence of a new transgression has come to light the Commission has chosen to deal with the particular issue in isolation. While acknowledging that a pattern of misbehavior would be significant, the Commission has refused to see such a pattern in the history of GPU's actions or inactions. See, slip op. at 27. Even in considering the various individual parts of the puzzle, the Commission has ignored the fact that there continue to be pieces missing which leave gaps in our information and preclude us from discerning the whole picture. The Commission has been satisfied with shuffling around individuals as a solution to GPU's problems. This approach quite

simply begs the central question in this proceeding.

The character, integrity and attitude of our licensees is a matter of fundamental importance. The Commission's limited resources preclude 100 percent inspection of an operating plant. The Commission's role is, therefore, limited to one of auditing only a small portion of the activities of the licensees. Since licensees are in direct control of the plant, they must be relied upon to provide the first line of defense to ensure the safety of the public. The Commission must be able to rely on the licensees to provide accurate and timely information. A lack of candor or truthfulness in licensee submittals to the NRC undermines NRC regulation and poses a threat to the public health and safety. The Commission must also be able to rely upon licensees to have the commitment and willingness to

implement their programs in an effective manner and with the commitment to safety as the first priority. As our Appeal Board noted in the Midland case, "[u]nless there is a willingness -- indeed a desire -- on the part responsible officials to carry it out to the letter, no program is likely to be successful." Consumers Power Co. (Midland Plant, Units 1 and 2), ALAB-106, 6AEC 182, 184 (1973). Finally, the Commission must be able to rely upon a licensee to comply with NRC requirements. A consistent pattern of violating Commission regulations may show a lack of corporate integrity such that future compliance can not be assured, thus demonstrating that the licensee cannot be relied upon to act in accord with a commitment to the public health and safety. See for example, X-ray Engineering Company, 1 AEC 466(1966).

What does an examination of the

actions and inactions of GPU over the past six years show us? This is a licensee which had the worst accident in the history of nuclear power in this country. One would expect that such a licensee would learn from its mistakes and would want to strive for excellence in order to avoid even the possibility of such an accident ever occurring again at one of its plants. Instead, the history shows us a licensee which has been unwilling or unable to provide to the Commission accurate and complete information on significant safety issues. It show us a licensee which has been unwilling or unable to recognize its own problems, to acknowledge responsibility for its missteps and to take quick, effective action to uncover the causes of those problems and to resolve them. It shows us a licensee with a pattern of violating Commission regulations for the sake of

expediency, a pattern which began before the accident and which continues even to this day.

One of the most significant licensee missteps the Commission has discovered is the subject of the Hartman allegations. Prior to the accident at TMI-2, this licensee engaged in widespread falsification of leak rate tests at TMI-2. The company failed to have a valid leak rate test in place and then falsified results to avoid having to shut the plant down for repairs. the utility's response to allegations of leak rate falsifications was first to deny any such occurrences. After being indicted for criminal violations of the Atomic Energy Act, the utility ultimately pleaded guilty or no contest to several counts of the indictment which charged leak rate falsification and violations of NRC requirements. A guilty plea is considered

an admission of guilt, yet even at the court hearing on the plea GPUN's representatives tried to avoid admitting culpability.

The Commission also discovered that after the accident the licensee made a material false statement to the NRC in responding to the notice of violation resulting from the accident. After initially denying any wrongdoing, the licensee took action to remove individuals responsible for making the material false statements to the Commission, but only when it became apparent that the presence of such individuals might further delay restart of TMI-1. However, licensee did not admit wrongdoing in shifting the responsible individuals around; these individuals are still a part of the GPU organization, and there does not appear to be any legal bar to the licensee using those people to operate TMI-1 once the

plant is permitted to restart.

One of the most significant post-accident failures by GPUN was the cheating incident. As virtually all of the investigations of the TMI-2 accident have recognized, one of the root causes of the accident was human error, caused in large part by plant operators who were not trained to deal with the conditions present during the accident. How GPUN has chosen to deal with this fundamental deficiency in its prior operations provides a clear test of its competence and integrity, and its commitment to safety requirements. By an standard, GPUN fails that test.

Even though the company apparently had what appeared on paper to be an adequate training program (See, Metropolitan Edison Co. (Three Mile Island Nuclear Station, Unit 1), LBP-81-32, 14 NRC AT 478, (1981)), the licensee failed

to carry out that program in an effective manner. Most notable was the licensee's unwillingness or inability to instill in its employees a respect for NRC safety requirements and a commitment to meet those requirements in every respect. This failure by GPUN led to widespread disrespect for the program and to cheating on NRC and company operator license examinations. When confronted with evidence of widespread cheating the licensee's response can charitably be described as poor. The licensee's investigation into the cheating incidents was barely adequate according to the Licensing Board, and poor according to the Special Master. Metropolitan Edison Co. (Three Mile Island, Unit 1), LBP-82-56, 16 NRC 281 (1982) AND LBP-84-343, 15 NRC 918 (1982). Not until after GPUN could no longer deny the problem and not until it became apparent that this issue might

further delay restart and become the subject of a hearing would the licensee take significant actions both to ensure that the training program was upgraded to an acceptable level and to ensure that cheating would not recur. Only in order to reach a settlement with the Commonwealth of Pennsylvania would the licensee take any action against individuals who were involved in the cheating incidents (other than those designated as O and W in the reopened hearing). The Licensing Board has an adequate training program. Metropolitan Edison Co. (Three Mile Island, Unit 1), Licensing Board decision, May 3 1985. However, the fact remains that this is not because licensee made a decision to accept responsibility for this fundamental failure leading to the TMI-2 accident and to create a training program to be proud of. Rather, licensee's recent progress is

largely due to outside pressure and a realization that continued failures in their training program could further delay the restart of TMI-1.

The licensee's repeated failures to build a first-class operator training program, its failure to instill in tis employees a respect for training and operator licensing requirements, and its failure to acknowledge and deal forthrightly with the widespread cheating incidents and other weaknesses in its training program present a damning picture of GPUN's commitment to safety. It would be difficult, if not impossible, to condone these repeated failures by an NRC nuclear powerplant licensee. In the case of the licensee for the TMI units they are simply inexcusable.

Licensee management also knowingly and intentionally certified to the Commission that one employee had completed

the necessary prerequisites for taking an NRC reactor operator examination when licensee knew that that employee cheated on the licensee's qualifying examinations. 16 NRC 352.

The NRC staff has also concluded that licensee failed to file with the Licensing Board reports (BETA and RHR) relevant to an ongoing proceeding before that Licensing Board. Staff further concluded that GPU had not provided them to the Commission in a timely manner. NUREG-0680, Supplement No. 5 (July 1984).

Even staff recognized, in its July 1984 re-evaluation of the licensee's management integrity, a pattern in the above occurrences of activity by the licensee which, had it been known by the staff at the time the staff formulated its position on management in the restart proceeding, "would likely have resulted in a conclusion by the staff that [the

licensee] had not met the standard of reasonable assurance of no undue risk to the public health and safety." NUREG--680, Supp. No. 5, p. 2-2. The staff went on to conclude, however, that the licensee's present organization was acceptable. Id. That judgment was based upon a variety of factors: the staff's finding on the significance and extent of licensee participation in the pattern of events which the staff identified as the basis for its change in position; the staff's finding that the pattern of events which it identified as significant was all-inclusive; the staff's finding that the present licensee organization was a new organization in all significant respects, and the staff's finding regarding subsequent performance of the licensee's new organization.

The Commission agrees with the staff and concludes that all of the integrity

issues are thus resolved. But does the more recent history of the organization show a licensee striving for excellence? No, it does not. Unfortunately the Commission's conclusion fails to consider more recent occurrences which indicate that this "new" organization suffers from many of the same problems as did the old. Further, the record upon which the Commission makes its decisions is far from complete.

Under the "new" organization, procedural and safety violations continue to be a problem. A former Bechtel start up and test engineer, Mr. Richard Parks, made allegations that licensee's contractor for the TMI-2 cleanup violated safety and quality assurance procedures. Further, Mr. Parks alleged that he was fired as a direct result of his raising safety concerns about the TMI-2 Recovery Program. The Department of Labor

investigated Parks' discrimination complaint and substantiated it. Our Office of Investigations (OI) investigated the safety and procedural concerns raised by Parks and concluded that they were not only substantiated but that the allegations were merely illustrative of the problem and not exhaustive. Memo from Ben B. Hayes, Director, OI, to Chairman Palladino dated September 1, 1983, "Three Mile Island Nuclear Generating Station, Unit 2 - Allegations Regarding Safety Related Modifications and Quality Assurance Procedures." OI went on to conclude that:

> Senior licensee management was continually advised by TMI Quality Assurance and inhouse management of Bechtel's noncompliance with applicable procedures and safety misclassifications. The failure of senior licensee management to responsibly monitor Bechtel's work and hold Bechtel accountable is the underlying

cause of the TMI-2 procedural problems. Id. at p. 2.

On October 29, 1984 staff agreed with OI's conclusions that TMI senior personnel were aware of the need to comply with GPUN administrative procedures, that they did not do so even though they were evidently aware that such compliance was an NRC requirement, and that the circumvention of requirements was "at least to some degree deliberate" and that "their motivation appeared to be expediency rather than confusion." Memo from W. J. Dircks, EDO, to the Commission dated October 29, 1984, "Investigation of TMI-2 Polar Crane Allegations." Once again licensee failed to exhibit a willingness or capability to carry out its own programs in an effective and safe manner or to adhere to NRC regulations. And when licensee or contractor personnel attempted to raise safety concerns, licensee's response was not to examine those concerns and to make

a reasoned response; it was to get rid of the complainer.

One would think that after his OI report identified such serious concerns with the TMI-2 Recovery Program, this licensee would ensure that such violations did not recur. However, we have additional information which indicates that similar procedural and safety violations have occurred at TMI-2 once again. Obviously, GPUN has been either unwilling or unable to take adequate measures to ensure that its own program will be carried out and that NRC requirement will be complied with.

Even more disturbing than this, however, is the licensee's recond on environmental qualification of electrical equipment (better known as EQ). Such qualification is necessary to ensure that safety equipment will perform its intended function in the harsh environments

resulting from a serious accident like that which occurred at TMI-2. Again, one would expect GPUN, because of it TMI-2 experience to make every effort to understand the issue and to ensure that its equipment at TMI-1 is fully qualified. But is that the case? No, it is not. Staff responsible for EQ has told us at a recent Commission meeting, that GPUN has been the most difficult licensee it has had to deal with on this important safety issue. The limited certification of equipment qualification necessary for restart has taken almost a year for the staff to accomplish because GPUN seemed not to know what was required of it. Instead of being in the forefront of industry efforts to assure equipment qualification, GPUN proves to be the worst performer in the nation. Once again this licensee has exhibited its failure to understand and to implement NRC

regulations.

The licensee has, then, a consistent pattern of violating Commission regulations. The most recent evidence seems to show that this pattern has continued rather than that it has been broken as the Commission concludes. I recognize that there has been many personnel and organizational changes at TMI-1. However, given the history and the seeming continuation of an inadequate commitment to safety by this corporation, I am unable to conclude that GPUN has the requisite corporate integrity and competence such that we can have reasonable assurance that GPUN can be relied upon in the future to comply with NRC requirements and to act in accordance with a commitment to the public health and safety.

I am also unable to conclude that there is reasonable assurance that this

utility has the requisite corporate character and integrity because there are significant gaps in the record of this proceeding. On those issues which the Commission has considered and which have not been considered by a licensing board, the Commission's basic approach has been to treat each issue in isolation. The solution to each issue has been to allow GPUN to transfer those individuals primarily responsible for various licensee failures to other parts of the GPU organization not responsible for the actual physical operation of the TMI-1 plant.[2]

[2] With the exception of a few employees directly involved in the leak rate falsification at TMI-2, the Commission has not even required that those transfers be made permanent. There is no legal bar to licensee using those people in TMI-1 operations other than a requirement that a few employees get Commission permission before being allowed to work in operational or significant management positions. Further, some of

By following this piecemeal approach, the Commission has refused to take a larger view of the licensee's corporate character or address the root causes of GPUN's problems in the area of corporate character. The Commission has instead been satisfied with band aid, short term fixes. The Commission has not addressed the issue of why this licensee continues in its pattern of failing to adhere to requirements or whether the band aid fixes really solve the underlying problems. I recognize that this broader integrity question is not an easy issue to address. What is needed is an integrated look at all of these integrity issues to determine: what are the root causes, why does this corporation seem to be unwilling or unable too comply with regulations and

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those transferred still work at TMI-1. The Commission's solution -- out of sight, out of mind -- thus does not forthrightly face up to the issue. It merely postpones it -- presumably until after restart.

what remedial actions are necessary to ensure future compliance? The sub-issues are many and complex, and there are massive amounts of information which must be considered, experts to be consulted. The Commission is not really equipped to do all of this, but licensing boards are particularly useful in and perfectly capable of performing this function. The Commission seems to have recognized this when it established this proceeding in 1979 and decided to have licensing board consider the issues initially. In the interest of expediency, however, the Commission has chosen now not to follow this more reasonable approach and allow the licensing board to consider all of the relevant information on this issue.

A further benefit to a hearing would be that the gaps in the formal adjudicatory record would be cured. Much of the information relied upon by the

Commission in making its immediate effectiveness decision and its decision on whether further hearings are necessary has never been the subject of a formal hearing as the Commission said its decision would be when it set up the proceeding in 1979. Metropolitan Edison Co. (Three Mile Island Nuclear Station, Unit No. 1), CLI-798, 10 NRC 141(1979). While we have much information and the staff's conclusions about present management, the Licensing Board has never been given an opportunity to hear the information and the parties have not been given an opportunity to test that information in an adjudicatory setting. Written comments on written reports are hardly an adequate substitute for the in-depth treatment these issues would receive in a hearing. I previously identified several issues which I believe specifically ought to be heard by the Licensing Board to make the record

complete. This would further enable the Licensing Board to address the issue of whether all necessary remedial actions have been taken to ensure licensee competence and integrity. See, Dissenting Views of Commissioner Asselstine, CLI-85-2, 21 NRC at 342 (1985).

A particularly significant gap not only in the record but also in our information base to be used in making this decision is the lack of information on the leak rate falsification issues. There has never been a complete, public investigation of this matter. The Office of Investigations (OI) did not complete its investigation of this issue, and the information available to the grand jury is not available to us for evaluation. We have some information which clearly indicates that at least at TMI-2 the leak rate falsification was widespread and condoned, if not encouraged, by first

level management. However, we do not know who precisely was involved. Nor do we know whether anyone above the first level of management should be held responsible. We do not know, therefore, whether all necessary remedial actions have been taken. Without such information I am unable to reach a conclusion on management competence and integrity. See Id. at 346-49 for a more complete discussion of this issue.

A further benefit of a hearing on these issues would be to increase public confidence in our decisionmaking, and in the safety of the plant. The people of central Pennsylvania are not unreasonable. All most of them want before TMI-1 is permitted to restart is to know that the NRC carefully considered all of the evidence and did the best it could to ensure that TMI-1 will be operated safely. Having forced to endure one

serious nuclear powerplant accident, the people of central Pennsylvania deserve nothing less than a full and searching inquiry into every relevant safety issued before TMI-1 is allowed to restart. Above all else, the Commission owes it to them to make every effort to ensure that TMI-1 will be operated safely. Unfortunately, by its actions today, the Commission is turning its back on that responsibility. The Commission's decisionmaking process, and its refusal to allow further hearings has not promoted public confidence. Rather, it has only served to harden opposition to restart and to cause needless distress for the people of the TMI area.

Because it has now concluded that all questions about GPUN's competence and integrity have been resolved, the Commission has chosen to do little in the way of providing additional oversight and

safeguards for this troubled plant. In recognition of the fact that this utility has not operated TMI-1 for six years, the Commission provides for some additional NRC oversight. However, this oversight of TMI-1 operations is vaguely defined at best, limited in time, and largely left to the discretion of the staff. Given the questions still remaining about this licensee, the Commission should have required more, both to ensure that the Commission can have confidence that the plant will be operated safely and to help increase public confidence. Such additional measures could provide some early warning of safety weaknesses in TMI-1 operation. The Commission should at least require the following:

1. There should be continuous NRC resident inspector coverage at TMI-1 -- 24 hours a day, 7 days a week for

a period of not less than one year. Additional NRC inspectors could be drawn from Region I and other regions.

2. There should be a special inspection program for TMI-1 including: performance appraisal team inspections every 6 months, intensive periodic regional inspections and a systematic assessment of the Licensee's performance every 6 months, for at least one year. The staff should then meet with the Commission after each review so that the Commission can personally monitor TMI-1 operations.

3. There should be special safety awareness training for all TMI-1 employees, including senior GPU management. These training sessions should be conducted by the NRC

Director of Inspection and Enforcement and the Administrator of Region I. The purpose should be to reemphasize to licensee the importance of carrying out safety programs in a manner designed to protect the public health and safety, the importance of proper training and the importance of complying with GPUN procedures and NRC requirements.

4. In order to increase public confidence further, the Commission should provide an opportunity for the Commonwealth of Pennsylvania to appoint an onsite representative who would have access to all GPUN-NRC safety information. The state representative could ask reasonable questions of NRC and bring safety issues to the attention of the Commission. This opportunity should

continue for a long as the Commonwealth finds it useful.

5. The Commission should also require an addition to the GPUN Board of Directors and the GPUN Safety Oversight Committee. This new director should be selected by the Commission, should be someone not affiliated with the nuclear industry and should be someone who possess a high degree of public credibility.

6. The Commission should quarantine by license condition from participation in <u>any</u> TMI-1 related activities all those individuals already quarantined voluntarily by GPU or by the Commission by license condition as well as the following:

    1. H. M. Dieckamp
    2. M.J. Ross
    3. B. Mehler

In order to restore any quarantined individual to TMI-1 related activities, a hearing should be required to specifically consider whether that individual possess the requisite competence and integrity to be involved in TMI-1 related activities.

7. There should be a specific requirement that licensee hold the plant at 25% power for a period of at least six months. Commission approval should be required at the end of that time before further power ascension is permitted. This is similar to the operational restrictions previously recommended by the staff. The licensee has not operated this plant for more than six years, and many of its personnel lack operating experience with the plant. A period of limited power

operation would permit a better assessment of the licensee's capabilities under actual operating conditions. At the same time, the limited power level would reduce accident risk somewhat by providing greater response times to deal with problem conditions should they arise.[3]

Without the completion of hearings on

[3] Although both a Licensing Board and an Appeal Board have concluded that the corrosion of the steam generators has been adequately addressed by the licensee, I am not convinced that we have seen the last of the corrosion problems resulting from the licensee's introduction of thiosulfate into the reactor coolant system. The corrosion event creates some degree of uncertainty about the quality of the materials, both in the steam generators and in other portions of the primary system, including the pressure vessel internals. Because this is a novel problem, there is an added advantage of a 25% limit on power operation in providing additional protection while gaining more experience with the adequacy of these remedial actions.

certain management competence and integrity issues (as I have outlined above and in my dissent on CLI-85-2) and the imposition of more specific additional safeguards, I am unable to conclude that there is reasonable assurance that GPUN will operate TMI safely. Given an opportunity through further hearings on these issues, it is possible that GPUN could provide sufficient evidence to establish that its present organization has the requisite competence and integrity to operate TMI-1 in a safe manner. But since the Commission has refused to hold further hearings, I must reach my decision on the record now before us. The present record leads to one clear and inescapable conclusion: this licensee has failed to demonstrate that it is fit to hold an NRC license to operate a nuclear powerplant. I cannot, therefore, join the Commission's order which permits restart of TMI, Unit

1.

ADDITIONAL VIEWS OF CHAIRMAN PALLADINO ON TMI-1 RESTART

The decision on whether or not to lift the immediately effective shutdown orders placed on Unit One at Three Mile Island in 1979 has not been an easy one for me. Extensive expressions of concern have been raised by many local citizens and political leaders. Last week, the Commission heard many of these concerns re-expressed in oral presentations on TMI-1 restart. As a Pennsylvanian I know first hand the reaction of some of the public during the stressful days following the accident at TMI-2.

The Commission has given careful consideration to public concerns through its attention to the underlying health and safety questions in this case. Indeed, the Congress in the Atomic Energy Act, has directed the NRC to make decisions

regarding the licensing of nuclear reactors, such as this one, on the basis of its own expert health and safety judgment and analysis of whether the detailed regulatory requirements of the Commission have been satisfied. Thus, while we are aware of of the sentiment of many members of the public, the Commission must base its decision to authorize restart on its conclusion that there is reasonable assurance that this plant will be safely operated.

I am voting to lift the shutdown orders and allow operation of Three Mile Island, Unit 1 because I am confident that GPU Nuclear can and will abide by NRC requirements and will operate Unit 1 so that public health and safety will be adequately protected. My confidence is based on: (1) the four favorable partial initial decisions of the Licensing Board after extensive public hearings; (2) the

NRC staff's review and conclusion, sustained in the hearings, that the shutdown orders should be lifted; and (3) my own review of the available information as discussed in the proposed order.

My confidence is bolstered by the greater-than-usual NRC regulatory scrutiny that will be given to this licensee and this plant during initial startup. Our inspectors will be there to oversee the licensee's activities during this important time period.

I continue to believe that the Commission was correct in its February 1985 decision not to hold more hearings on additional topics. There already has been more that 150 days of hearings. In addition, the Commission itself has spent countless hours on the TMI-1 restart matter, including sessions in Harrisburg.

It is important to recall that in 1979 the Commission stated that the public

hearing called for in the shutdown orders was to resolve concerns so as to provide reasonable assurance that the facilities could be operated without endangering the health and safety of the public.

Thus, the question that needed to be answered about the additional topics for hearings was whether or not the topics would bear upon a decision to keep Unit 1 shut down. The information that was considered by the Commission in making its decision not to hold further hearings and the reasons for the decision are public, and I believe they support that decision.

The Commission's February 1985 order addressed specific matters proposed for further hearings at that time. These included: (1) the likely change in the staff's position in Supplement 5 of its Safety Evaluation Report; (2) the handling of allegations by Mr. Richard Parks, a former Bechtel Operations Engineer,

regarding violation of TMI-2 cleanup procedures; (3) the Hartman allegations of TMI-2 leak-rate falsification; and (4) allegations of TMI-1 leak-rate falsification. I believe a brief comment on each of these items is in order.

With regard to the question of the likely change of the staff's position, there were four issues raised by the staff. The Commission's February 1985 order explained the reasons for concluding that none of the issues posed a significant safety issue. Two of the issues relate to items on which we held hearings and the remaining two items hold no continuing significance because they relate to individuals who no longer are involved in operating TMI-1.

With regard to the parks matter, this had to do with TMI-2. The facts were investigated and harassment of Mr. Parks was found. However, no widespread pattern

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of discrimination, harassment or intimidation was shown and the major GPU Nuclear official involved is no longer with TMI-1 or GPU Nuclear organizations. Thus, it is a TMI-2 issue.

With regard to the Hartman matter, as a separate item, we have ordered that all individuals who were suspect in the TMI-2 leak-rate falsification are to be covered by a future hearing, with the exception of those individuals that were found by the U.S. Attorney to not have participated in, directed, condoned, or been aware of the acts, or omissions, that were the subject of the Hartman indictment. We also found, on the basis of a separate NRC investigation that it was unlikely Mr. Ross knew of or was involved in TMI-2 leak-rate falsification. Thus, the Hartman matter, as a restart issue, has been dealt with.

The TMI-1 leak-rate falsification

allegations have been investigated by NRC; no pattern of deliberate falsification was found. The Commission found that there were no significant factual disputes concerning leak-rate practices at TMI-1, and that the facts as currently known did not raise a significant safety issue which might have led the Licensing Board to reach a different result.

I believe that the major management faults which existed in 1979 have been corrected. The current organization is a different and improved organization from the one which operated Three Mile Island in 1979. It is a significantly improved organization in terms of personnel, organizational structure, procedures and resources. I am satisfied that the pre-accident management faults have been corrected.

Public confidence is a key issue for GPU Nuclear and TMI-1, and for nuclear

energy and its regulators. Public confidence must be earned over and over again. In the case of TMI-1, public confidence was damaged by events surrounding the accident at TMI-2. GPU Nuclear has publicly stated that excellence is its standard and has made changes aimed at fulfilling that goal. The NRC and, I am sure, the public will be monitoring their performance closely.

I have read both the long and short versions of Commissioner Asselstine's dissenting views, and I feel compelled to make the following additional comments on three of his points.

First, I do not agree with Commissioner Asselstine's statement that the Commission is turning its back on its responsibility to make every effort to ensure that TMI-1 will be operated safely. The question of whether or not this reactor can and will be operated

safely has been of significant concern to the Commission since NRC shut the reactor down in 1979. It was the NRC which kept TMI-1 shutdown after the 1979 accident. It was NRC that conducted the extensive series of hearings on the adequacy of TMI-1 and its management. And, it is the NRC which plans to take extra precautions during the startup and power ascension phases. Thus, we have not turned our back on our safety responsibilities; rather, we have fulfilled them in an extra-ordinarily comprehensive manner for TMI-1.

Second, Mr. Asselstine criticizes the Commission for having addressed management competence and integrity in a piece meal fashion without examining the pattern established by individual actions. While, of necessity, individual flaws in TMI management had to be treated one-by-one, because they did not all arise at the same time, significant management changes were

made to restore our confidence in overall management competence and integrity. I do not believe that those were trivial changes or merely "shuffling around individuals" as Mr Asselstine suggests.

The management faults which existed in 1979 have been corrected. The present organization is different from and improved over the one that operated Three Mile Island at that time.

Third, I believe Mr. Asselstine is wrong in saying that the Commission has chosen to do little in the way of providing additional oversight and safeguards for restart of the plant. On the contrary, the Commission has set forth two important conditions that speak to this point:

1. (1) To ensure a safe return to operation, licensee is to submit a power ascension schedule, with hold

points as necessary at appropriate power levels, to the NRC staff for staff's approval. The plant cannot be restarted prior to staff approval of such a schedule; and

2. (2) The NRC staff prior to restart is to provide to the Commission for its information a general description of a program to provide increased NRC oversight at TMI-1 during the period of start-up and power ascension, beginning with initial criticality, and any time period thereafter staff feels to be appropriate.

The staff does not take lightly such Commission direction. I am sure that it recognizes the importance of this task and based on past performance will not overlook necessary actions to fulfill these conditions.

In closing, let me reiterate my view that the 1979 shutdown orders should be lifted, thus allowing TMI-1 to resume operation subject to the conditions set forth in this order; I believe that this can and will be done with reasonable assurance that public health and safety will be adequately protected.

STATMENT OF COMMISSIONER ROBERTS ON TMI-1 RESTART

In August 1979 the Commission ordered TMI-1 to remain shutdown and a hearing to be held to determine whether its further operation should be allowed. At the time they ordered the hearing the five Commissioners who then held office anticipated that a decision on restart could be reached in approximately one year. See the Attachment to CLI-79-8, 10 NRC 141 (1979). That assumption turned out to be overly optimistic. Almost six years have elapsed and now that hearings on all issues believed by a majority of the presently incumbent Commissioners to be material to a restart decision have been completed, no one who was a Commissioner at the time a hearing was ordered is a Commissioner.

The record of the proceeding is a

massive one. The Licensing Board charged by the Commission with taking evidence and reaching an initial decision has made findings favorable to restart. Moreover,the Appeal Board and the Commission have completed appellate review of all hardware/design issues, all emergency planning issues, and all management issues except the training and mailgram issues considered by the Licensing Board on remand. Only if we have sufficient remaining concerns regarding favorable resolution of the training and mailgram issues to warrant maintaining the effectiveness of the shutdown order can we legitimately do so, since the law requires the lifting of an immediately effective license suspension once the concerns that justified imposing it have been adequately resolved. That being so and having neither found nor been provided any legitimate reasons to delay

any longer a decision on lifting the immediate effectiveness of the license suspension imposed in July 1979, I believe the Commission has a duty to make its decision now.

Therefore, although I do not doubt the sincerity of the concerns expressed by those who oppose a restart decision now and am aware of but cannot agree with the fears of those who believe the plant should never restart, I will vote to allow restart.

I also join in the comments made by the Chairman in response to the dissenting views of Commissioner Asselstine.

STATEMENT BY COMMISSIONER ZECH:

Six years ago, the accident at Three Mile Island Unit Two changed the course of commercial nuclear power. The accident that was not supposed to happen did happen. During the first few hours and days of the accident, there was considerable confusion as to the danger presented by the damaged Unit Two nuclear plant. The citizens of Pennsylvania became the victims of lack of information, poor communications and ineffective licensee and governmental actions. Even though our best evidence now indicates that there were no adverse radiation effects as a result, the emotional impact on the public was substantial. The accident generated widespread fear and a deep mistrust of the licensee and the responsible regulatory agency--the Nuclear Regulatory Commission.

During those early days of uncertainty, as a precaution, and a proper one in my view, the undamaged nuclear plant at Three Mile Island--Unit One--was ordered shut down by the Commission. The Commission then decided that TMI-1 should remain shutdown until the problems which led to the TMI-2 accident were identified, debated in a public hearing, and adequately resolved. There has been six years of adjudication, investigation, analysis, monitoring, a Presidential inquiry, as well as other actions. As a result of the accident, many lessons have been learned and applied to TMI-1 over the past six years. The adequacy of the many changes that have taken place as a result of these lessons has been argued in extensive public hearings held by the Commission's Licensing and Appeal Boards. I believe that as a result we now have the necessary information to decide whether it

is proper to allow the undamaged Unit One to restart.

While many changes in personnel, procedures and equipment at Three Mile Island and elsewhere have been put in place to enhance safety of operations and to minimize the possibility of another Three Mile Island accident, the question we are facing today is have all the necessary changes been accomplished at Three Mile Island to permit the restart of Unit One?

It is important, I believe, to separate where possible, the issues involving undamaged Unit One and those involving the cleanup of the damaged Unit Two. It is my opinion that the cleanup of Unit Two could have been managed more efficiently and more effectively. However, it now seems to be progressing in a satisfactory manner and in any event the evidence leads me to conclude that cleanup

of TMI-2 will not interfere with the safe operation of Unit One.

In addition, a very serious consideration must be for the views of the people of central Pennsylvania. Although it appears that many citizens favor starting up the Number One Unit, it also appears that many do not favor a restart and are genuinely concerned for their health and safety.

While respecting this concern, we, as regulators, are faced with a personal responsibility, under the law, which requires that, if we are reasonably assured that the public health and safety will be protected, we must lift the order suspending the license to operate TMI-1. Attempting to arrive at this personal decision concerning the health and safety of our fellow citizens places a very heavy burden of responsibility on each Commissioner. In the case of Three Mile

Island, I believe we have a special responsibility. The issues of management competence and integrity have been central in this proceeding. I believe them to be the most important considerations in deciding whether to authorize a restart.

I do not condone some of the conduct or the practices which have occurred at the Three Mile Island site in the past. However, the crux of the matter for me is whether these past occurrences continue to create doubt about the technical competence and integrity of the licensee's present TMI-1 management team. Both parent corporate entity and the management team responsible for the operation of TMI-1 have changed substantially. The licensee's current organizational structure strikes me as sound, with provisions for sufficient check points to assure that safety is paramount. I have given careful consideration towards

forming a judgment concerning the technical competence and integrity of the individuals in positions of responsibility. My conclusion is that I have confidence in them in both areas. I emphasize that I have not reservations about the competence and integrity of the people who are directly responsible for the safe operation of TMI-1. If I did, I could not support resumed operation. However, if subsequent events change my judgment, I will dedicate my efforts to prompt correction.

Unfortunately, despite six long years of NRC deliberations and licensee management and organizational changes, public confidence in this licensee has not been fully restored. In my judgment, it will be up to the licensee through sustained excellent performance to earn the confidence and respect of Pennsylvania's citizens. While that

performance record is being accumulated, continuing vigilance and dedication by both the licensee and regulator will be required to assure the licensee carries out its primary responsibility to provide reasonable assurance that the public health and safety is protected throughout the life of the license. I am satisfied that the licensee has the team in place to provide that assurance. I will do all that I can as a regulator to see that the licensee maintains the requisite competence and integrity. I am also satisfied that all other concerns have been adequately addressed.

My conclusion, after reviewing the record and with the staff's certification that all Nuclear Regulatory Commission requirements have been met, is that Three Mile Island Unit One can be operated with reasonable assurance that the public health and safety will be protected.

General Public Utilities has an obligation to ensure, not only now but during the term of the license, that TMI is operated with the greatest of care and with every regard for the public health and safety, that all involved with TMI perform in the most competent manner possible and that they take every measure to earn the special trust and confidence, not only of the citizens of Pennsylvania but of all the citizens of the United States.

I vote for restart of Three Mile Island Unit One.

In addition, I agree completely with the Chairman's comments on Commissioner Asselstine's dissent.

SEPARATE VIEWS OF COMMISSIONER BERNTHAL

May 29, 1985

This decision today on TMI-1 restart, and the Commission's earlier vote on Feb. 13, represents the most visible failure to date of that elusive ideal -- the collegial decision-making process. It is not the first example of failure in that process, but it is far and away the most important, one which shows in embarassing detail how the people of Pennsylvania and the people of this country, whether supporters or opponents of TMI, have been robbed of what they deserve -- a truly collegial decision by the Commission.

It has been evident for more than a year that the basis existed for a Commission consensus decision on this issue. Unfortunately, the decision-making process, as contrived by your Congress and your Commission, permits such an outcome

only as a long-shot random chance coincidence in views among the Commissioners.

What the Commission and the public have lost as the Commission wandered down this unwise and ill-considered path toward the restart vote today is the opportunity to see a job done convincingly and right. Instead, the Commission has in all likehood set the stage for endless wrangling over what is done and what is undone, what is known and what is unknown, what is true and what is untrue in these six years and thousands of pages of one-the-record-and off-the-record TMI proceedings.

I have repeatedly said that it is in the public interest to have a thorough airing of all the remaining issues and questions related to the unfortunate accident at TMI-2. I have repeatedly urged my colleagues, right up to the 11th hour,

to reconsider this ill-advised path toward restart. I find the Commission's methodology for restart to be crudely insensitive to what should be a paramount concern -- public confidence. The Commission majority's path for restart runs contrary to the broad public interest in knowing all that can be learned about the events leading up to and following the accident at TMI.

I recognize that legitimate concerns can attach to the needless imposition on this licensee of burdensome, confidence-diminishing measures proposed by some as a condition for restart. But the Commission should also display equal concern, prudence, and foresight in assessing the need for the public to know. Where the Commission should have gone the extra mile -- in the case of providing support for the Pennsylvania Dept. of Health's long-term health-effects

study, in its receptiveness to the urgent pleas a few weeks ago of the TMI Advisory Panel to serve as a conduit for public concerns, in the far-reaching decision in February not to clear the air on all remaining questions outstanding --the Commission has instead chosen to go only the extra inch.

Indeed, the history of TMI has been a history of such mistakes. No one would argue about the mistakes that led to the accident itself. But early on, in the wake of the accident, there should have been less concern in all circles, local, state, and national, for the possible consequences of a utility bankruptcy, and more concern for an expeditious cleanup of the world's worst nuclear accident.

The Congress failed to act first, and determine responsibility later, in getting about the urgent business of cleanup. What other country in the world, given the

circumstances, would have haggled over responsibility or even dollars first, and have then left cleanup of the worst commercial nuclear powerplant accident to an uncertain future in the hands of an uncertain utility.

Then the Commission itself contrived an ill-conceived hybrid proceeding, neither fish nor fowl, neither adjudicatory nor enforcement, a proceeding that virtually precluded any possibility of orderly and timely resolution of the issues.

Nor have I particular admiration for the way this licensee conducted many of its affairs before, during, or since the accident. In a real-world, competitive market, unprotected by regulation at all levels of government, such grievous mistakes would cost you the store.

Nevertheless, despite the occasional desires of some Commissioners to act as a

surrogate Board of Directors for this licensee, that is emphatically not the function of the Commission. For all the breast-beating that has gone on over the last several years about management competence and integrity, it is still wonderfully strange that no Commissioner has ever raised more than a half-hearted, second-thought question as to the same management's credentials and abilities to operate another plant at Oyster Creek -- and no Commissioner has ever mounted a serious attempt to shut down or prohibit further operations at that site. One is led to suspect that the much discussed questions about management integrity and competence have more to do with suspicious than with supportable basis in fact.

Almost a year ago, I urged the Commission to appoint, even at what appeared to be that late date, a Special Master to carry out all remaining hearings

before the Commission, itself, so that those issues could be closed once and for all. What appeared then to be a late date has turned out not to have been so late after all. And instead, the Commission has now spent exactly one more year trying to justify and procedurally legitimize its decision not to pursue further the issues I had previously identified. And so goes the still unconcluded history of the TMI accident and aftermath.

While I could continue at length to analyze and ponder and pontificate on which issues are closed, half-closed, or open, that would now serve little useful purpose. Whether this or that action, inaction, deed, or misdeed renders GPU management fit or unfit, better or worse than average will not assuredly debated for tears. Not one member of the Commission sitting here today was present at the creation of this thing, and that

anyone here today will see it brought to an end.

But before the arguing and recriminations ensue, the public deserves to know whether, by objective evaluation of the physical preparation of this plant, and by all reasonable measures of licensee management, personnel and capability, I find that TMI-1) can and will, with reasonable assurance (and then some, one must add for the case of TMI) be operated in conformance with the requirement to preserve the public health and safety.

On February 13, the majority of this Commission decided, in CLI-85-2, that no further hearings were required as a part of the TMI restart proceeding. I agreed with the majority at that time that hearings were not required as a <u>legal</u> matter. I at that time and still believe that it is important, indeed critical, that our decision be one that will pass

legal muster. However, there is and always has been more involved in this matter than strict legality.

Like it or not, the accident at TMI-2 has been responsible for increased skepticism concerning the nuclear energy option on the part of a significant segment of our fellow citizens. Thus, the way in which the Commission decides to handle the restart matter affects not only licensee and the citizens of Middletown, or even just the citizens of Pennsylvania. It is a decision which will have a great deal to do with how people across the country will view both this Commission and the nuclear energy option in general. Therefore, while a legally defensible position is critical, equally important in this, of all cases, is public confidence in the fact that the Commission has exhausted all resonable avenues of inquiry which can shed further light on the events

associated with the country's worst commercial nuclear power accident. These considerations formed the basis for my disagreement with the majority position in February.

This restart proceeding has occupied an extraordinarily long period of time and has generated a massive record which constitutes the most in-depth look at a facility and its management in the Commissions" history. It is precisely because so much time and so many resources have been devoted to the technical review of this facility and examination of its management that it is a shame to jeopardize public confidence in the ultimate decision by failing to resolve several issues about which there are still nagging doubts on the part of the significant segments of the interested public. I still dissent from my colleagues, choice to forego any further

consideration of those issues (CLI-85-2).

At the same time, however, no available information leads me to believe that a decision otherwise favorable to restart would be impacted, as a legal matter, by further examination of the issues identified either by me or my colleague, Commissioner Asselstine. More importantly, although sound public policy considerations dictate to me that a further hearing should have been held, I firmly believe that, as a technical matter, this facility can now be operated in a manner wholly consistent with public health and safety.

Technical judgments, that is, judgments regarding the actual safety of a particular facility, can only be made in comparison to accepted standards of safety at other plants which the Commission has licensed to operate. Technical issues of safety at TMI-1 are, for the most part,

very similar to issues at other pressurized water reactors, and in particular, to other Babcock and Wilcox plants now operating. In so far as the procedures, systems and operating crews are similar to other licensed facilities, the important question becomes whether these procedures, systems, management and operating teams are equal to or better of other plants. All available information suggests that TMI-1 measures up very well to that standard.

Nevertheless, there are certain unique technical aspects to the restart of TMI-1 which could have a significant impact on safety, and which must be carefully considered in making this decision. First, one must consider the steam generator tube degradation and the unique tube repair technique which was utilized by the licensee. There is near universal agreement among technical

experts that the steam generators to their original licensing basis. This matter has been thoroughly litigated and has resulted in a decision by the licensing board favorable to the licensee. Further, even though steam generator tube performance will be carefully monitored by GPU and NRC, one must keep in mind that the steam generator tube rupture event has been taken off the list of unresolved generic safety issues, because the public health and safety consequences of such an event are now generally conceded to be small.

The second unique feature which must be considered with regard to TMI-1 is the fact that it has been idle for six years. Although maintenance of equipment at the plant has been extensive since it was shut down in 1979, problems can be expected in systems that have been out of normal service for such a long time. However, in anticipation of possible restart problems

the planned startup will be unusually cautious and deliberate, with many hold points on the way to full power. Power ascension activities will be carefully monitored by round-the-clock presence of NRC staff personnel -- an extraordinary policy for either initial startup or restart of any reactor.

A third possible concern is the fact that there have been numerous changes in operations and management personnel, and this this turnover has disadvantages due to the fact that potentially valuable experience has been lost. However, an extensive training program, reviewed and approved in protracted hearings should serve to alleviate that concern. The staff has been consistent and clear in its opinion that the present management and operating team at TMI-1 have the capability and commitment to operated the facility safely.

In addition, the concert has been raised that operation of TMI-1 with the TMI-2 cleanup continuing a short distance away will pose significant safety problems. However, all of the information at the Commission's disposal indicates that he two operations can be conducted concurrently, consistent with public health and safety, and that in fact there is little or no association between the two.

Finally, it should be noted that, although several Category A deficiencies were originally found by FEMA as a result of emergency planning exercises, those deficiencies have been corrected, and emergency planning is now found to be fully acceptable for TMI-1. For all of the above reasons., I believe that as a technical matter TMI-1 can and will be operated in a manner fully consistent with public health and safety.

Having said this, I must also say that, to the extent I can do so consistent with my mandate to protect public health and safety, I do not intend to hold an otherwise appropriate Commission decision hostage to the mistakes and poor judgment of this or previous Commissions. It is also in the public interest that the six-year suspension of operations at TMI-1 be lifted when it is safe to do so -- indeed the law requires the Commission to do so. There is clearly no reconciling that fact with my dissatisfaction over the tortuous path the Commission has chosen to take us from June 1984 to June 1985 and beyond.

By now, it it quite clear where the Commission decision today is headed, and although I take strong exception to the Commission's disregard for what I consider to be elementary and neglected public policy considerations, it is also

essential that where confidence is deserved in this decision, confidence should be fostered.

The action of the Commission majority in closing the record in this case may not inspire much public confidence in the wisdom of the Commission. But the public can and should have confidence that this plant is indeed ready for operation -- that it meets or exceeds the standards the Commission has laid down and requires at 93 other plants in this country, Commission has laid down and requires at 93 other plants in this country, from San Onofre, to St. Lucie, from Grand Gulf to Oyster Creek. I therefore will lend my concurrence to the vote of the majority today in so finding.

UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

Nos. 85-3301, 85-3302, 83-3310, 85-3315

THREE MILE ISLAND ALERT, INC., et al.
Petitioner, No. 85-3301

COMMONWEALTH OF PENNSYLVANIA,
Petitioner, 85-3302

UNION OF CONCERNED SCIENTISTS,
Petitioner, 85-3310

NORMAN A. AAMODT and MARJORIE M. AAMODT,
Petitioner, 85-3315

vs.

UNITED STATES NUCLEAR REGULATORY COMMISSION, NUNZIO J. PALLADINO, CHAIRMAN, and UNITED STATES OF AMERICA.

Respondents

METROPOLITAN EDISON CO., JERSEY CENTRAL POWER & LIGHT CO., PENNA. ELECTRIC CO., and GPU NUCLEAR CORP.,

Intervenors

SUR PETITION FOR HEARING

PRESENT: ALDISERT, Chief Judge, SEITZ, ADAMS, GIBBONS, HUNTER, WEIS, GARTH, HIGGINBOTHAM, SLOVITER, BECKER, STAPLETON, MANSMANN, Circuit Judges

The petitions for rehearing on the merits filed by Petitioners in the above entitled case having been submitted to the judges who participated in the decision of this Court and to all the other available circuit judges of the circuit in regular active service, and no judge who concurred in the decision having asked for rehearing, and a majority of the circuit judges of the circuit in regular active service not having voted for rehearing by the court in banc, the petitions for rehearing are denied. Circuit Judges Adams and Sloviter would grant the petition.

By the Court,

_____
Circuit Judge

Dated: Sept. 19, 1985

UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

Nos. 85-3301, 85-3302, 83-3310, 85-3315

THREE MILE ISLAND ALERT, INC., et al.
Petitioner, No. 85-3301

COMMONWEALTH OF PENNSYLVANIA,
Petitioner, 85-3302

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Petitioner, 85-3310

NORMAN A. AAMODT and MARJORIE M. AAMODT,
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vs.

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Respondents

METROPOLITAN EDISON CO., JERSEY CENTRAL POWER & LIGHT CO., PENNA. ELECTRIC CO., and GPU NUCLEAR CORP.,

Intervenors

ORDER

It is ORDERED that the stay order of June 7, 1985 shall remain in effect until 4:00 p.m. on September 25, 1985, it being understood that there shall be no further extension thereof and that, in the absence of action of the Supreme Court of the United States or a Justice thereof otherwise providing, the stay shall be vacated at 4:00 p.m. on September 25, 1985 and the mandate will issue at that time without further order of this Court.

By the Court,

_____
Circuit Judge

Dated: Sept. 19, 1985

Snowhill Farm, Rural Delivery 5
Springdell Road, Box 428
Coatesville, PA 19320

November 30, 1979

Ivan W. Smith, Esquire, Chairman
Atomic Safety and Licensing Board
U. S. Nuclear Regulatory Commission
Washington, D.C. 2055

Dr. Walter H. Jordan, Member
Atomic Safety and Licensing Board
881 West Outer Drive
Oak Ridge, Tennessee 37830

Dr. Linda W. Little, Member
Atomic Safety and Licensing Board
5000 Hermitage Drive
Raleigh, North Carolina 27612

In the Matter of METROPOLITAN
EDISON COMPANY, Three Mile
Island Nuclear Station,
Unit No. 1, Docket No. 50-289
(Restart)

Dear Mr. Chairman
and Members of the Board:

At the prehearing conference in Harrisburg, November 14, 1979, petitioners were given the opportunity to respond to the Nuclear Regulatory Commission Staff brief on rulemakings and to substantiate

request for an Environmental Impact Statement (EIS) to be made prior to the Three-Mile Island Nuclear Station, Unit 1 (TMI-1) restart hearing, presently scheduled for February, 1980.

Petitioner has experienced some difficulties which have delayed preparation of this response, hence is requesting leniency in the servicing of this response and additional time to add to reasons for request of an EIS.

Petitioner also desires to respond to a letter, discussed a that meeting, addressed to the Board on November 13, 1979 regarding the licensee's offer to provide duplication and service of documents for intervenors.

Additionally, petitioner wishes to discuss comments made by the Board at that meeting relative to provision for legal counsel for intervenors.

1. Regarding the NRC Brief on the

Effect of Rulemakings upon the Issues of the TMI-1 Suspension Proceeding, petitioner is in agreement with staff's conclusions regarding rulemakings. It is respectfully suggested that evidence brought forward in the hearing may aid subsequent or ongoing rulemaking by the Commission. Erring on the side of duplicity would appear a better course due to the serious and grave consequences that could result from oversights.

2. Regarding the November 13, 1979 letter of Shaw, Pittman, Potts and Trowbridge, counsel for licensee, Metropolitan Edison Company, to the Board, petitioner objects to certain stipulations:

Page 2, Number 3 of this letter requires intervenors to "hand deliver" a copy of the document to be duplicated and serviced to Middletown, Pa. (Option A) or Washington, D.C. (Option B) during normal

working hours or on Page 3, Number 4, to deliver by Express Mail (Option C), Federal Express (Option D) or comparable reliable messenger service to Washington, D.C. office of counsel. (Option designation those of petitioner.) Licensee states refusal to accept delivery by ordinary mail.

Assuming preparation of intervenor's documents in Coatesville, Pa., Option A and B would require from three to five hours if automobile and fuel were available, or as much as double that time if public transportation were used. Option C is not available at Coatesville, the closest U.S. Post Office offering this service being at King of Prussia, Pa., distant approximately one hour driving time. Cost of Express Mail is $7.50 per pound. Option D, Federal Express, is less viable from Coatesville, the nearest office being in Wilmington, Delaware, with

cost of a Courier Pack Envelope being $17.50. Documents mailed by Federal Express on Friday would not be guaranteed delivery until noon on Monday. The Postmaster at Coatesville, Pa. estimates that regular mail service ordinarily takes no more than one additional day over Express Mail. Since regular mail service has been used for service of nearly all documents relating to this hearing, it would seem (if this offer is intended as interpreted by staff at the Harrisburg meeting) that if an intervenor, by necessity, would channel documents through the licensee, that this should not be prevented by extraordinary requirements for delivery.

By this same letter of November 13, the licensee has acknowledged that intervenors need assistance in duplicating and distributing correspondence in order to minimize delay of the hearing process.

However, the processing of correspondence through the licensee would shorten the time available to intervenors to meet deadlines for response. It would give the licensee the "first look" and advantages gained from this in making their response. Intervenors' need for secretarial and financial assistance would work in favor of licensee in the proceeding. Petitioner, therefore, requests the board for advice in regard to licensee letter of November 13 and financial assistance.

3. Regarding legal and other assistance to intervenors, petitioner refers to NRC Staff Response to Petition to Seek NRC Funding for Consumer Intervenors, November 21, 1979, that (page 5) "regulation requires a person to petition the licensing board to certify the question to the Commission..."

At the Harrisburg meeting, the Board

stated that petitioners had presented themselves in a sophisticated manner that did not require counsel. However, it would seem to petitioner that in pursuing any job at its best level, full and proper tools are necessary. If, therefore, any contention is deemed worthy to be worked, and that work is required to be accomplished through legal process, it would appear that legal counsel is a necessary implement for all workers. For intervenors to perform in a manner and with expertise that has required lawyers years of preparation and experience, or to address their time to meet demand of other schedules, as well as those of the hearing, or to meet these requirements from inadequate funds would, it seems, not be in the best interest of an expeditious and complete hearing. If a full and fair hearing is accomplished without such aid to intervenors, it would seem to

petitioner that the sacrifice required of intervenors would not be in accord with the traditional fairness of the courts.

Further evidence of the appropriateness of legal counsel for all is the use of many such counsel by licensee, NRC and Board, although all have many distinguished scientists, environmentalists, etc. as employees or members. These counsel will be working with his hearing as their primary work area.

Petitioner, therefore, respectfully requests the Board to certify this question to the Commission.

4. Due to illness of petitioner, holiday celebration including a family trip last weekend, and business commitments of family, petitioner was not able by this day to visit resource centers provided by licensee and staff to prepare a brief in support of an Environmental

Impact Statement. Petitioner requests additional time to prepare evidence, while entering Section 5 as area of interest.

5. Regarding the need for an Environmental Impact Statement, petitioner wishes to put before the Board Contention 7 from page 3 of Petition for Intervention of Marjorie M. Aamodt, October 22, 1979 which reads, in part:

"10CFR100.11(b)(3) rules that the combined routine releases from more than one reactor at a single site cannot exceed the maximum allowable releases, implying acknowledgement (by the Board) of the total radiation dose to the environment."

Petitioner understand from a Discovery meeting with staff that licensing has proceeded on a site by site basis, however, Rules and Regulations, Part 20, Standards for Protection Against Radiation acknowledges the limiting factor of "prior dose" (20.102) for workers. The

cumulative nature of radiation is well-established and accepted. Petitioner proposes that these concepts were not incorporated to include the residents in the fifty mile area around the site when the final Environmental Statement for TMI-1 and 2 was prepared in December, 1972.

Petitioner's residence in Southern Chester County is at the center of a perimeter of nuclear operation and construction, involving a total of fourteen plants within 23 to 48 miles. this area has received fallout from previous atmospheric testing, particularly the Chinese fallout of 1977 (43, FR58790).

Petitioner requests that an EIS include study of "prior and total dose" of residents within fifty miles of TMI-1. The final Environmental Statement for TMI-1 an 2 (NUREG-0552, page V-25, paragraph 5) acknowledges the concept of total dose,

referring to "combined dose to all individuals living within fifty miles of the station" (regarding gaseous effluents, however the concept was not truly applied in a manner which assessed the true, and in fact, exposure and proposed exposure of the public.

Petitioner fearfully and humble calls attention of the Board to the geographical situation, present and proposed, which may be unique, and for which there may be little or no precedent and requests discretionary action pursuant to 10CFR2.801, leaning on the arguments of staff. (NRC Brief on the Effect of Rulemakings upon the Issues of the TMI-1 Suspension Proceeding, November 16, 1979).

Studies since the December 1972 Environmental Statement indicate that risks of low-level ionizing radiation might be greater than determined through extrapolation from effects of higher

doses. (NUREG-0558, page 49 footnote). From page 51 of this same study comes the sombre warning:

"The exact numerical value for the risk of genetic injury from low doses in man is uncertain."

Therefore the restart of TMI-1 does involve a "major Federal action significantly affecting the quality of the human environment" (National Environmental Policy Act of 1969), and we request the Board to rule that a final environmental statement be required before restart of TMI-1. The principle basis known to petitioner is Hanly v. Kleindienst 471F2d823 (2d Cir. 1972), 412 US908 (1973) where court held (471F2d at 830-31):

".... the agency in charge, although vested with broad discretion, should normally be required to review the proposed action in the light of .... the absolute quantitative adverse

environmental effects of the action itself, including the cumulative harm that results from its contribution to existing adverse conditions or uses in the affected area. [Emphasis that of petitioner.]

In addition, the recently promulgated regulations by the Council on Environmental Quality implementing the provisions of NEPA stated:

"Agencies shall prepare supplements to either draft or final environmental impact statements if .... There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts." (40CFR1502.9(c)(1))

Because it has been the policy of the Board to consider Class 9 accidents outside of the review process in licensing procedures, and parallely outside the scope of all heretofore prepared

environmental statements, it is evident that the events associated with the TMI-2 failure provided many new circumstances and provided much new information relevant to environmental concerns which bear on the proposed reopening of TMI-1.

Petitioner and family request the assurance of an environmental statement that takes into account the total accumulated and projected radiation exposure of persons, animals and food supply. In addition, since the life investment of petitioner and family is in the land, animals and buildings with the 'nuclear circle' described (a situation that is common to many farm families in this circle), petitioner requests that the combined probability of nuclear accident, including Class 9 accidents, be studied, with resolution of compensation for loss or depreciation.

Respectfully submitted,

Marjorie M. Aamodt

Attached Service List

THE THREE MILE ISLAND ACCIDENT
AN INVESTIGATION OF THE EFFECT ON THE HEALTH OF RESIDENTS AND FLORA IN THREE AREAS WNW AND SW OF TMI

BY

Marjorie M. Aamodt
Principal Investigator

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6 - "COLLAPSED/RUPTURED ORGANS' .....
7 - SUMMARY OF UNUSUAL EXPERIENCES ON MARCH 28-30, 1979.....
REPORTED BY RESIDENTS WNW OF TMI ..

AFFIDAVITS - All identifications of names, streets, addresses expurgated.

1 - (2 pages)
2 - (1 page)
3 - (1 page)
4 - (1 page)
5 - (1 page)
6 - (2 pages)
7 - (1 page)
8 - (1 page)
9 - (1 page)

Attachment 1 - NEONATAL HYPOTHYROIDISM CASES, LANCASTER COUNTY, 1979 - 1983

APPENDIX A - RATIONALE FOR DERIVING BASELINE CANCER MORTALITY DATA FOR THREE AREAS SURVEYED WEST OF TMI

Foreword

The author is appreciated of the investigative and other efforts of Francine Taylor and Mary Osborn, without whose continuing and devoted help this analysis of the citizen's health study would not have possible.

The parallel work of the Three Mile Island Public Health Fund to verify the cancer mortalities and their provision of this information has been greatly appreciated.

1.0 ABSTRACT

Data collected from interviews with residents in three areas which were in the path of radioactive releases from the Three Mile Island accident demonstrate that cancer mortalities in these areas during the post-accident years 1980 through 1984 are seven times greater than would be expected.

Interviews with the residents in these areas have provided 'horror' tales of effects that are remarkedly similar to those caused by exposures from five to one-hundred rems of ionizing radiation.

Analysis of flora growth abnormalities gathered in the same areas, geographically, led an expert to conclude that these abnormalities could have been induced by radioactive fallout from the Three Mile Island accident.

Although residents have attempted to raise the issue of serious health effects

in animals and people, no official agency has responded by undertaking a bonafide investigation.

2.0 INTRODUCTION

The official publicly-stated opinion is that radiation releases at the time of the Three Mile Island accident were negligible. This opinion has, however, been challenged by a number of studies. The most comprehensive of these is a review of all dose assessment studies by Dr. Jan Beyea under the auspices of the Three Mile Island Public Health Fund.

On Friday, March 30, 1979, three days into the accident, measurements of 1200 millirems were made directly over the plant stacks with helicopters. This demonstrated the presence of unheard-of-amounts of radiation outside the plant. However, the measurements taken from the helicopters were grossly optimistic. The helicopter blades forced

the plume away from the measuring instrument.

No dosimetry was on the ground in the areas that were surveyed for health effects. The effects that the people experienced can serve as a more reliable measure of radiation dose than extrapolations from plant releases and distant meters. The flora in the area can also provide that information. In fact, the clue to the kinds of radioactive material released may still reside in the trees and soil.

Following is a summary of the results of surveying a population of approximately 450 people in areas where radioactive plumes passed in the early days of the Three Mile Island accident.

3.0 THE HEALTH SURVEY

3.1 METHOD

A group of women and men, several of whom had expertise in conducting surveys,

went from door-to-door.[1] An interview form, organized on the basis of information provided by Dr. Carl Johnson of Denver, Colorado was used. (See Attachment 1.)

Two areas (No. 1 and 2) were selected because information from other investigators[2] had identified a high frequency of reports of erythema and metallic taste by the residents. A third area was chosen because it, like the other two areas, was at a high elevation with an unobstructed view of the Three Mile Island nuclear plants. Figure 1 summarizes the demographic characteristics of these areas.

[1] The primary interviewers were Francine Taylor, Norma Ritterspach, Jane Lee and Marjorie Aamodt. Assisting were Joyce Corradi, Linda Barash, Sally Stephenson, Brenda Witmer, Marie Inslee, Paula Kinney, Susan Folta, Helen Hocker, Mary Osborn, Erma Weaver, Cory Folta and Austin Ritterspach.

[2] Eileen and Mitsuru Katagiri, work unpublished

Almost every household was willing to provide the information solicited. There were no refusals in Area 1, four in Area 2 and 2 in Area 3. The interviewers represented themselves as a group of citizens that were interested in health problems.

In view of the pioneering effort the survey represented, several excursions were made to interview residents outside of the survey areas because their unique experiences came to the interviewers' attention. these "outside" interviews were helpful in drawing conclusions, however they were not added into the survey date.

While the questionnaire did 'suggest' symptoms, the interviewers found, without exception, that this did no more than remind the participant. All interviewers were of the opinion that the residents were conservative in their provision of

FIGURE 1 - DEMOGRAPHIC CHARACTER

Area	Direction from TMI	Dis
1	West Northwest	4
2	Southwest	3
3	West Northwest	8

RISTICS OF AREAS SURVEYED

tance	Elevation	Above Sealevel
1/2-6mi.		600-750'
1/2mi.		650'
mi.		900'

information and that what was obtained was less then actually existed. For instance, a woman with an obvious lump in her did not mention it until the interviewer directly questioned her about it. The reluctance to report diagnoses of tumors or cancers in living persons, possibly because of associated stigma, was apparent when, on followup, an additional six tumor/cancer diagnoses, existing at the time of the survey, were finally revealed.

3.2 RESULTS OF THE SURVEY

The survey produced the following significant information:

a. a cancer mortality rate for the combined area seven times greater than would be expected for the population surveyed,

b. a large number of tumors and cancers in living persons that were diagnosed in the period 1979 through 1984,

after the Three Mile Island accident,

c. other health effects including anemias and skin rashes which were diagnosed/experienced for the first time after the Three Mile Island accident,

d. eleven birthing abnormalities in the nineteen pregnancies occurring from 1979 through 1984,

e. unexplained medical phenomena of collapsed or ruptured major organs occurring in four residents and a fifth person residing outside the areas surveyed but in a west northwest direction in a line with surveyed areas 1 and 3,

f. first-hand accounts by residents of their experiences on March 28, 29, 30 and April 2, 1979, the early days of the Three Mile Island accident.

3.21 CANCER MORTALITY RATE

Figure 2 presents the cancer mortality rate analysis. The estimated numbers of persons in all households (the

population) for the areas surveyed was verified by the West Shore School District survey conducted about the same time and tax maps. The prior estimate of 457 persons was lowered to 433. Eighteen of the twenty cancer deaths reported were verified by death certificates obtained from the Pennsylvania Health Department. Two reported deaths were dropped; one (cancer) occurred before the accident (1978) and the other was not attributed to cancer on the death certificate. (This latter one may be added in to the data if a check with the attending physician provides evidence that cancer was a contributing cause of death.) One cancer death certificate was delayed because the the place of death was a hospital and not the residence. A cancer death, not obtained in the survey (noone was at home), was discovered in the followup, and the death certificate was obtained. Thus,

twenty cancer deaths have been verified as occurring in the areas surveyed during the post-TMI-2 accident period.

FIGURE 2 -CANCER MORTALITY RATE A
OF TMI

Area	1
No. of Households	3
No. of Households Contacted	3
Population of Area	11
Cancer Mortalities 1979 - 1984	
Cancer Mortalities 1980 - 1984	
Cancer Mortality Rate 1980 - 1984 Per 100,000 Population	
Ratio of Cancer Mortality Rate for 1980-1984 Over Expected	

NALYSIS FOR THREE AREAS WEST

	3	2	All	
7		15	87	139
4		13	53	100
1		54	278	433
7		3	10	20
7		3	9	19
				1,097
				7.13

In figuring the cancer mortality rate, the single death for the year of the accident was dropped, so that the post-accident period considered are the calendar years 1980 through 1984. The baseline datum was derived as appropriate for the rural areas where they survey was conducted. The rationale for this figure, 153.4 cancer deaths per 100,000 population, is provided as Appendix A.

The cancer death rate for the areas surveyed is 1,097/100,000 for the years 1980 through 1984. This is 7.13 times greater than the expected cancer death rate (2.6 expected, 19 found). The population base was large enough to provide a 95% level of confidence in the statistical analysis.

Figure 3 lists cancer deaths chronologically, providing year of death and quarter, age, sex and diagnosis on death certificate except in case #13 where

the death certificate has not been viewed. For cases #9 and #10, the information was provided, telephonically, by the Pennsylvania Health Department and all causes were not obtained. The median age at the time of death was 54 years, sex was equally divided. The dates of diagnosis of the cancer are not yet available. From the interview information, the best determination that can be made is that four cancers were diagnosed prior to the accident: cases #1, #2, #3, #8. The following cases were diagnosed after the accident: cases #4, #5, #7, #10, #12, #13, #16, #17, #18. There is no information concerning ther other diagnoses.

3.22 CANCERS AND TUMORS IN LIVING PERSONS

Figure 4 presents the number of cancer/tumors in living persons by area, approximate age, sex location of

FIGURE 3 - VERIFIED DEATHS LISTED CHRONOLOGICALLY

O.	YEAR (Quarter)	AGE	SEX	DIAGNOSIS, IMMEDIATE CAUSE, DUE TO OR AS CONSEQUENCE OF
1	1979 (2)	49	F	Respiratory failure, Metastatic Carcinoma of breast
2	1980 (2)	72	M	Cardiorespiratory failure, Metastatic Carcinoma, Carcinoma of prostate
3	1980 (3)	79	F	Cardiac arrest, Acute Congestive Heart failure, Dehydration, ...Chronic Lymphatic Leukemia
4	1980 (4)	55	M	Carcinomatosis, Carcinoma of the colon
5	1980 (4)	30	F	Cardio-respiratory failure, Lymphoma of lower spine with metastasis
6	1981 (1)	71	F	Carcinoma of Ovary with B..... Metastosis and Ascites
7	1981 (2)	63	F	Cardiorespiratory Arrest, CVA, Metastatic Carcinoma of of breast
8	1981 (3)	68	M	Cardiorespiratory arrest, Metastatic carcinoma of prosta of prostate
9	1981 (3)	45	F	Melonoma
10	1981 (4)	60	M	Oat cell carcinoma
11	1982 (2)	53	M	Cardiorespiratory arrest, Metastatic carcinoma of lung
12	1982 (2)	48	F	Malignant Brain Tumor (Astrocytoma)
13	1982 (3)	50	F	Leukemia
14	1982 (3)	71	F	Cardiopumonary arrest, metastatic cancer, undetermined etiology
15	1982 (4)	51	M	Multiple Myeloma
16	1983 (4)	48	M	Cardio-respiratory failure, Metastatic Brain, Cancer, Lung Cancer
17	1984 (1)	46	M	Cardiopulmonary Arrest, Lung cancer, COP?, Esophageal Bronchial Fistula
18	1984 (2)	65	F	Metastatic Maligant Melanoma
19	1984 (4)	77	M	Hepatic coma, Adenocarcinoma Colon & Liver Met
20	1984 (4)	77	M	Hyper bilirubinemia, tumor, probable carcinoma h... of pancreas, obstructive jaundice

affliction. There were 26 cases reported among the surviving persons in the households contacted, or 298 persons. It is not expected that all incidences have been reported; one case was finally reported after more than a dozen contacts with the family. The reluctance appeared due to concern that this information might effect a career or other plans. There was reluctance where a daughter had lost ovaries. In that family, case #3, a second daughter is undergoing testing to determine whether leukemia is the cause of listlessness and high white blood cell count.

These data would suggest a continuing cancer mortality rate far in excess of that expected for this population. Although the date of diagnosis was not obtained, nineteen of the afflicted had certainty that the tumor/cancer was first noticed after 1979. In three cases where the throat was involved (all cancers) and the growth on the vocal cord, all persons were non-smokers.

FIGURE 4 - CANCERS AND TUMORS IN LIVING PERSONS

Area	Number	Sex/Age	Site
1	8	F/	Ovaries
		F/22	Breast
		M/38	Muscle, shoulder
		M/44	Colon
		M/48	Shoulder, Spine
		M/25	Vocal cord
		M/63	Eye, Skin
		F/65	Breast
3	6	F/40	Liver
		F/48	Uterus
		F/32	Breast
		F/57	Breast
		F/54	Lymph
		M/55	Spine
2	12	F/20	Breast
		F/43	Breast
		F/43	Breast
		F/39	Upper Arm
		F/40	Uterus
		F/62	Thyroid
		M/64	Colon
		F/67	Blood, Spleen, Skin
		M/67	Skin, Throat
		M/70's	Throat, Lung
		M/70's	Throat, Jaw
		F/70's	Leg
All	26		

3.23 CANCER/TUMOR CLUSTERS IN FAMILIES

The clusters in families of cancer deaths and cancers/tumors in the living appears extremely unusual and warrants investigation. The clusters suggest a common exposure rather than a genetic predisposition since two cases (#8, #9) were not blood-related. In cases #3 and #6, the diagnoses within a family were made no more than six months apart. The most obvious factor that the family clusters had in common was location; the next most common factor was that one, both or all in a cluster were outside during the early days of the accident. This was true for case #1 (both outside all day), case #2 (one outside), case #3 (one outside all day), case #7 (both outside all day), case #8 (both outside all day), case #9 (both outside most of day). The persons in case #1 were in an open-sided

building, but under the cover of a roof; these persons experienced the plethora of symptoms (metallic taste, erythema, lost of hair, diarrhea, nausea described in Affidavit 1). Some of these symptoms were reported in the other cases, however this information was not uniformly pursued by the interviewers. Where one person was outside, the hypothesis is that this person carried radioactive particulate material into the house and, in this way, those persons who remained indoors were impacted.

FIGURE 5 - CLUSTERS OF CANCER DEAT
DIAGNOSES IN FAMILIES

Case	Relationship in Family	Ages
1	Father, Son	
2	Father, Daughter	
3	Father, Daughter	
4	Father, Son, Daughter	
5	Mother, Daughter	
6	Mother, Daughter	
7	Husband, Wife	
8	Husband, Wife	
9	Husband, Wife	
10	Husband, Wife	

HS AND CANCER/TUMOR

Affliction	LUMP LUMPS
48/25	(Vocal Cords) (Shouder, Spine)
44/22	(Colon Cancer) (Breast Cancer)
38/19	(Muscle Cancer) (Tumors Ovaries)
72/46/40	(Cancer Death) (Cancer Death) (Liver Tumors)
57/32	(Breast Cyst) (Breast Cyst)
43/20	(Breast Cyst) (Breast Cyst)
64/65	(Colon Cancer) (Cancer Death)
67/67	(Skin, Throat) (Leukemia, Spleen & Skin Cancer)
70/70	(Throat, Jaw Cancer) (Skin Cancer)
50/50	(Lump on Spine) (Cancer Death -Leukemia)

3.24 OTHER HEALTH EFFECTS

Other health effects reported in the survey areas as first occuring after 1979 were most notably five cases of anemia, an unquantified number of skin disorders of several distinct types and, among nineteen pregnancies between 1979 and 1984, eleven abnormalities. In addition, there appeared to be a category of traumatic illness which have been designated, for lack of a more scientific determination, as "ruptured/collapsed organs". This phenomena occurred with sufficient frequency (4 in the survey areas to be noticed) and to afflict persons who reported the full range of radiation-related symptoms during the first three days of the TMI-2 accident. (These persons provided affidavits 1 and 6.)

3.241 The eleven birthing abnormalities (nineteen pregnancies) were

as follows: one defect, five miscarriages (one with fetus outside womb), one stillbirth, three non-elective Caesarean Sections, one premature birth. All occurred since March 1979; the birth defect and pregnancy termination with fetus outside the uterus occurred in 1979. One would expect to see 5% birth defects and a 12% spontaneous abortion rate (defined as a pregnancy loss during the first six months of pregnancy). The observed events of these kinds (6) were twice the expected (3.1). The number of C sections suggest an area of investigation that was eliminated by design from the pregnancy outcome study undertaken by the Pennsylvania Health Department.[3] Importan data may have been overlooked since

[3] "Three Mile Island (TMI) Nuclea Accident and Pregnancy Outcome", George K Tokuhata, Joyce Kim, Jane Bratz Pennsylvania Health Department.

veterinarian, practicing on the west shore, noted a fourfold demand in pigs for C sections in 1979. These and other important animal data were dismissed by the official agencies because whole body counts did not indicate radiation relationship and no other cause suggested itself.[4] It appears to be a gross error that caused the animal problems to be handled rather lightly. The attribution of crippling and other deformaties in cattle to the sudden occurrence of a selenium deficiency in the soil is remarkable. The decrease in symptoms after the addition of selenium to the cattle diet was considered confirmatory whereas there was also a correlation with the amount of radiation released from TMI.

3.242 The reports of skin problems were remarkable but difficult to

[4] NUREG-0738, EPA 600/4-80-049

quantify.[5] They included tingling skin, greying and loss of hair reoccurring rashes (most frequently on the face and arms), erythema at the time of the accident and a few reports since, sprays of cysts, red spots, "bruise-like" marks, darkened skin, sensitivity to the sun, blister on lips and in the mouth, open sores, melanoma and other skin cancer. These were also reports of dogs with blisters on their feet and bellies, and loss of hair. These phenomena have continued to be experienced but with a decreased incidence since the accident at TMI. These symptoms are remarkably similar to those experienced by victims at Rocky Flats and Hiroshima.

3.243 The cases of "ruptured/collapsed" organs are summarized in Figure 6 by year of occurrence, survey area, sex age and description of the

[5] Not all categories that now appear important were included in the interview.

FIGURE 6 - COLLAPSED/RUPTURED ORGANS

Area	Sex/Age	Afflicted's Description	Year Occurred
1	M/43	Aortic Valve Ruptured	1981
3	F/19	Lung Collapsed	1980
3	M/53	Spleen Ruptured	1983
3	F/29	Two Arteries to Heart Blocked	1984
WNW Beyond 1 & 3, Elevated	F/55's**	Kidney Collapsed	1983

*Provided Affidavit 1
**Provided Affidavit 6

phenomena provided by the afflicted.

All instances of the "phenomena" were in the WNW direction of TMI. Two cases were in persons who had experiences on March 29 and 30 which appear to be high dose radiation effects. The following effects occurred, according to the afflicted, "spontaneously".

3.3 STATEMENT OF RESIDENTS WHO EXPERIENCED EFFECTS MOST REASONABLY ATTRIBUTED TO EXPOSURE TO HIGH-DOSE RADIATION

Affidavits 1 though 7 present first-hand accounts of what appears to be touchdown of plumes from TMI-2 on or near residents in the areas surveyed and three other locations, WNW of TMI. Figure 7 summarizes the experiences by affidavit, location from TMI, and sex/age.

There are several common factors. All persons were outside when their experience began (except the dentist who indicated that the door facing the SE was probably open). The experiences in the WNW direction from TMI all occurred on the first three days of the accident. There is a commonality of experiences: Metallic taste was mentioned by #1,2,5 and 7. erythema was mentioned by #1,2, and 6. Burning skin was mentioned by #1,2, and

possibly 4. Tearing and/or red eyes was mentioned by #1,4. Nausea was mentioned by #1,2, and 5. Hair loss was mentioned by #1 and 6. Immediate skin problems were mentioned by #1 and 6.

4.0 RADIATION EFFECTS ON PLANTS

Affidavit 9 was provided by James E. Gunckel who is a recognized authority on radiation effects in plants. Dr. Gunckel's pioneer research concerning ionizing radiation effects on plants was conducted at the Brookhaven Laboratories and Rutgers University for 34 years. Three papers published by Dr. Gunckel are referenced at Attached 3.

Dr. Gunckel examined plants and leaves provided by Mary Osborn of Swatara, Pennsylvania. The flora were gathered in the area of her home, NW of TMI, approximately six miles. Other specimens were provided by a resident from her yard approximately three miles NNW of TMI. A farmer, whose home and farm are located two miles NNW of TMI provided Affidavit 8 which describes the necessary changes in his farming practices since the accident. He can no longer grow clover seed, an

FIGURE 7 - SUMMARY OF UNUSUAL EXPERIENCES ON MARCH 28-30, 1979
REPORTED BY RESIDENTS WNW OF TMI

Affidavit	Date	Distance	Sex/Age	Experiences on Date, Subsequently ()
1	3/29-30	4mi.	M/43	Metallic taste; very red face, neck, hands; nauseous, eyes red and burning, felt like looking through water, lips and nose blistered; throat and chest burning; taste of burning galvanized steel,(severe diarrhea, hair loss on head, arms, legs and torso; sore that would not heal; spontaneous collapse of aortic valve.
2	4/2		M/40's	in light mist Outside in the evening between 6-7; skin burning; face, arms and hands reddened and remained red for about 12 hours; metallic taste; nauseous; felt "funny" in head; saw doctor 24 hours later - found symptoms matched radiation induced.
3	3/30		F/40's	Outside on porch for few minutes in afternoon; heard "rain" in the trees although it was not raining; very still;

			no usual sounds of birds.
4	3/28	M/40's	Eyes watering and burning after ten min. walk outside; eyes watered entire night;(problems with eyes: burning, red in appearance; red mark on side of nose, rash on forearms reocurring.)
5	3/28-29	M/40's	Metalish taste; queasy stomach; felt "funny"; X-ray films fogged (75 approx.)
6	3/30	F/55's	in evening Engulfed in wave of heat on porch/as rain momentarily stopped; face felt tingly; within an hour face and arms pink; following day skin darker pink, itch at front of scalp two days later hard little lumps appeared on forehead into hairline; scalp felt prickl and tingly; three weeks later many gray hair accross front of hair; hair falling out; subsequent weeks skin on forearms and neck darkened and scaled; (permanent discoloratio of skin on forearms, neck and face; sensitiv to sunlight; bruise easily; number of spots on face and chest - yellow centers; sudden loss of kidney function).
7	3/28	F/40's	Metallic smell and taste, very strong outside at 6 am. Not noticed a 8 am outsi

experience shared by farmers in the area as far as 15 miles from TMI. He mentioned the absence of the bee which pollinates red clover since the time of the TMI accident.

Dr. Gunckel thoroughly examined all specimens brought to him to rule out the effect of insects or disease. He questioned Ms. Osborn concerning the location of the specimens to rule out the effects of roadside spraying and agricultural spraying. There were two sessions spanning about ten hours that Dr. Gunckel devoted to examining specimens. He described the anomalies as "entirely comparable to those induced by ionizing radiation -- stem faciations, growth stimulation, induction of extra vegetative buds and stem tumors. He concluded that "it would have been possible for the types of plant abnormalities observed to have been induced by radioactive fallout on

March 29, 1979." This was the day when 1200 mr releases were measured at the stack, an indication of large amounts of radiation being released from the plant, however not a reliable measure of the amount since the helicopters forced the plume away the measuring devise.

Dr. Gunckel hypothesized the exposure of the plants as beta ray exposure from radioisotopes (^{32}P, ^{65}Zn, ^{45}Ca) for twenty-four hours. He raised a point about the relative "quality factor' of gamma and beta radiation, which appears to be contrary to what is generally assumed but is incontrovertible on the basis of experiments he conducted. That is that beta rays are at least a quality factor of two in plants.

Dr. Gunckel has been provided with description and pictures of dandelion leaves that are 31 inches long that were picked this summer on the property where

(Affidavit) 1 was working on March 28 and 29 of 1979 and other flora effects. He believes that these anomalies are evidence of continued impact from radiation other than background.

5.0 DISCUSSION

The suggestion that the cancers present in the areas surveyed were initiated by radioactive releases from the TMI accident defies the generally accepted theory of a period of considerable latency following exposure. We suggest that this theory is not viable in the present case. We believe that the critical exposure was to beta and alpha particulates and that the biological effects were similar to those described by Dr. Gunckel in plants.

The hypothesis of particulate exposure is supported by the residents' experiences on March 28, 29, 30 and April 2, reported in the affidavits. The suggestion that these experiences were not

unique to the three study areas is provided by the letter of Representative Stephen Reed to the NRC on August 8, 1979, provided as Attachment 2. the days on which these experiences occurred were reported as the same days as those of the persons who reside in the study areas, indicating a more extensive impact than in the study areas, i.e. "hundreds" of calls were received by Rep. Reed. This number of reports of phenomena which are discrete in kinds -- metallic taste, tearing eyes, diarrhea, skin rashes -- reported by a large number of people cannot be dismissed as hysteria. In fact, the symptoms were experienced before the occurrence or seriousness of the accident was know.

The fact that the types of experiences reported are those commonly associated with radiation exposure and that they occurred at essentially the same time that there were releases of radiation

from TMI-2 of undetermined amounts supports a conclusion that the experiences were radiation-induced.

The flora data also support that conclusion. Anomolies have been found in other areas indicating that areas of insult are not solely within the study areas.

Since the people and plants appear to have been the dosimeters, the amount and kinds of radiation released could be best determined from this information. According to a verbal communication with Ms. Osborn (mentioned above), and NRC authority, Dr. Edward Branigan estimated a dose in excess of 100 rems with errythemia. This again supports the particulate theory since a dose in excess of 100 rems (whole body) would probably have resulted in some immediate loss of life. We are not aware of such occurrences.

The soil sampling that has been done by the agencies was found less than credible because of the uniformity of the reports. (Beyea Report) The agencies (NRC, EPA, DER) did sampling of soil and water in the survey areas identified to them on August 30, 1984 and shortly thereafter. Some of the results of this testing have been reported and interpreted as being insignificant or due to weapons testing. (Letters from NRC and EPA - Travers to Aamodt, October 22, 1984 and Kirk to Aamodt, October 31, 1984). At the time, testing had not been completed; the remaining results have been promised shortly. None of agencies would agree to test for I^{129} as requested. Such a test would allow estimates of I^{131} that was released during the accident, a contested issue among experts.

Continued insult from the environment has been reported. In Area 1 of the

survey, residents continue to experience some of the same symptoms reported as occurring for the first time at the time of the accident. These experiences appear to be related to time spent out-of-doors.

We believe that the Pennsylvania Health Department's records may unravel some of the mysteries. There have, however, been difficulties experienced in obtaining these records.

The pregnancy data gathered in the study would lead to a vastly different conclusion than that arrived at by the Pennsylvania Health Department. The latter's conclusions of no significant increased in pregnancy-related problems was based on the comparison of pregnancies during the accident and after the accident. The assumption of no exposure following the specific period in 1979 of the TMI-2 accident to accident-related radiation is not supported by our

hypothesis of radiation remaining in the and. We are trying, as yet unsuccessfully, to obtain Dr. Tokuhata's raw data. In view of the verification of the cancer mortality data gathered from the interviews, the report of 11 abnormalities in 19 pregnancies in the study areas, we would not consider the pregnancy outcome a resolved matter. The listing of "disruption of the menstrual cycle" in Representative Reed's letter as a frequently reported symptom would indicate an impact from the accident on the reproductive system.

Despite the drop in neonatal hypothyroidism in Lancaster County to expected incidence from the high post-accidence incidence,[6] the explanation of consanguinity among the Amish for the

[6] Attachment 1, NEONATAL HYPOTHYROIDISM CASES, LANCASTER COUNTY 1979 - 1983

seven-fold greater incidence following the TMI-2 accident has not, as yet, been retracted by Dr. Tokuhata. A more valid hypothesis would appear to be that the Amish pregnant had a higher exposure than other pregnant woman to the releases from the accident because of their sociological practices. Amish women farm with their husbands and were more likely to be outside than other pregnant women as early in the spring as the accident occurred. The Amish family keeps its own cows and fresh milk is consumed.

6.0 SUMMARY

A study of health effects has been conducted with a population residing at high elevations in areas where the wind blew during the early hours of the accident at TMI-2. This study demonstrates:

1. a seven-fold increase over expected cancer mortality rate,

2. evidence of insult to this population, beginning March 28, 1979, which caused symptoms typical of those expected from high radiation exposure,

3. evidence of plant abnormalities, occurring only since 1979' which are related by a leading expert in radiation effects on flora to the accident at TMI-2,

4. evidence of non-genetically induced coincidental cancers within household groups exposed to the environment during the early days of the accident,

5. evidence of a doubling of expected human birth abnormalities since the accident,

6. evidence of an excessive number of tumors within the surviving population, suggesting a continued gross elevation of cancer mortality rate,

All of this evidence converges to support a hypothesis that severe radiation

effects were experienced by the study population as a direct result of early, heretofor unconsidered early releases from TMI-2 during the accident beginning March 28, 1979.

Case number: 1 6 1

A VOLUNTARY COMMUNITY HEALTH SURVEY

Date: _____

Location: _____

1. Have you been contacted by the Pa. Dept. of Health survey on TMI? ___ When? ___

2. Family name _____ _____ Willing to participate? yes _____ no _____

3. Family members:

name (doctor)	status	sex	birth-date	3/28/79 Location	3/29/79	3/30/79
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____

If deceased, when? _____ Onset of illness _____ Diagnosis _____ Dr. _____

4. Current address and phone no.: _____
Address on 3/28/1979: _____

5. Persons outdoors?

name	3/28-hours	3/29-hours	3/30-hours
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

6. If vacated the area:

who	to where	when left--when returned
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

7. Did anyone notice (indicate date, time, who)
a. unusual atmospheric conditions _____
b. metallic taste, smell _____
c. eye irritation, burning _____
d. skin irritation, reddening _____
e. irritation of nose, throat, chest _____
f. experience nausea _____
g. experience vomiting _____
h. experience diarrhea _____
i. experience headaches _____
j. develop hypothyroidism _____ hyperthroidism _____
k. within 2-4 wks unusual hair loss or color change _____
l. red spots under skin _____ bleeding gums _____
m. unusual bleeding _____
n. cancer _____ form _____ treatment _____ doctor _____
o. later was there confirmed (doctor) anemia _____ blood or thyroid disorder _____

8. women: If pregnant, date of last menstrual period before 3/28/79 _____
Complications with pregnancy? _____ stillbirth _____ miscarriage _____
premature birth _____ Date of birth _____ Wt. at birth _____
health of child since birth _____
caesarean section _____ Date of birth _____ wt. at birth ____
health ofchild since birth _____ crib death _____

9. History of disorders in family tree (leukemia, cancers, thyroid, etc.) _____

10. Animals.

name	age in 3/79	inside/outside	alive/dead	health problems
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

11. Additional comments _____

Dangerous Properties of Industrial Materials

Fifth Edition

N. IRVING SAX

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TABLE 5A.1. Summary of Effects Resulting from Acute Whole Body External Exposure to Radiation

0–25 rems	25–100 rems	100–200 rems	200–300 rems	300–600 rems	600 or more
No detectable clinical effects. Delayed effects may occur.	Slight transient reductions in lymphocytes and neutrophils.	Nausea and fatigue, with possible vomiting about 12½ rems.	Nausea, vomiting and diarrhea in first few hours. Latent period up to 2 weeks or perhaps longer.	Nausea, vomiting and diarrhea in first few hours. Latent period with no definite symptoms, perhaps as long as 1 week.	Nausea, vomiting and diarrhea in first few hours. Short latent period with no definite symptoms in some cases during first week.
	Disabling sickness not common, exposed individuals should be able to proceed with usual duties.	Reduction in lymphocytes and neutrophils with delayed recovery.	Following latent period symptoms appear but are not severe; loss of appetite, and mental malaise, sore throat, pallor, pitechiae, diarrhea, moderate emaciation.	Epilation, loss of appetite, generally malaise, and fever during second week, followed by hemorrhage, purpura, pelechiae, inflammation of mouth and throat, diarrhea and emaciation in the third week.	Diarrhea, hemorrhage, purpura, inflammation of mouth and throat, fever toward end of first week.
	Delayed effects possible, but serious effect on average individual very improbable	Delayed effects may shorten life expectancy in the order of 1 percent.	Recovery likely in about 3 months unless complicated by prior previous health, superimposed injuries or infections.	Some deaths in 2 to 6 weeks. Possible expectancy reduction of 10 percent of the exposed individuals for about 450 rems.	Rapid emaciation and death as early as the second week with possible eventual death of up to 100 percent of exposed individuals

would be completely absorbed by 1.1 g/cm² of aluminum it would also be absorbed by 1.1 g/cm² of air. However the absorber thickness would be only about 0.25 inch the aluminum and over 30 feet for air.

The result of ionization is merely a conversion of radiation energy into another form of energy within absorber, and it is these secondary effects which are the greatest importance in radiation protection work.

The primary effects of ionization and the distribution of this ionization over various path lengths in different absorbers have been mentioned previously. The different types of radiation also show different degrees absorption and these differences also are biologically significant. Alpha particles are heavy, slow moving and expend their energy in a relatively short path. They are therefore, spoken of as showing high specific ionization i.e., a large number of ions are formed per unit length path in the absorber. Gamma and x-radiations, on the other hand, require a great thickness of absorber for complete absorption. Gamma rays and x-rays have low specific ionization, i.e., the ionization is spread over the relatively long path required for complete absorption. Beta particles are intermediate in their specific ionization.

Biological Effects

The biological effects of radiation are considered here only in sufficient detail to be of assistance in problems of radiation protection. Some of the information that is required for an understanding of the concepts that have gone into the formulation of permissible levels.

X-rays or γ rays, because of their penetrating nature may dissipate only a fraction of their energy in passage through the body. This is particularly true of high-energy rays. The energy dissipated is, of course, the absorbed dose delivered to the body or portion of the body.

Radioisotopes, in contrast, may present a further hazard when the material is taken into the body where it radiates the tissues or organs internally. The most serious effects from this standpoint are produced by the α emitters such as Ra, H and Pu. They are particularly marked because α emitters outside the body expend their energy either in penetrating the clothing or the dead cells of the epidermis; usually the radiation cannot penetrate to living cells. Once they are taken into the body via ingestion or inhalation, this same property of short-range and high specific ionization increases their relative effect considerably. Emitters located in a small section of tissue will irradiate that small section very heavily.

Beta emitters can be both an internal and an external hazard. The range of most external β radiation is great enough that the outer tissues, at least, will be penetrated. The most common external effects have been radiation burns and malignancies of the skin. Internally, the

produce a considerable effect. Their specific ionization is high although not as great as that for α radiation.

The preceding paragraphs have emphasized the ionization effects, particularly specific ionization. Many secondary effects can be caused by the ionization process. It may disrupt molecules, it may destroy body cells, or the energy may merely appear in final form as heat released within the absorber. Depending on the location of the absorbing atom within the molecule, the ionization may or may not disrupt the molecule. If this molecule is in a critical place within the cell, the cell, its function, or its ability to reproduce itself may be destroyed. Many of these processes are reversible; that is, damage caused by molecule disruption or cell destruction can be reversed by the usual reparative mechanism of the body. This is confirmed by experimental data which show that a fixed total dose spread out over a period of weeks produces a smaller effect than the same dose delivered in a few minutes. However, in the case of large acute dose or continued chronic overexposure, there is the possibility that non-reversible damage will occur.

Another type of cell change which is possible is that the regulative functions of a tissue may be destroyed. In this case a carcinoma (cancer) may be produced. Although the mechanism is not fully understood, there is direct evidence that continued insult to a tissue may produce this result. The high rates of leukemia among radiologists, bone cancer among Ra dial painters, and lung cancer among miners of the Czechoslovakian, German, and U.S. uranium mines all point to radiation as the causative agent. This irreversible damage in chronic radiation exposure was apparently cumulative and the cumulative effects led to the illnesses.

Internal Emitters. The biological effects of radiation from radioisotopes in the body are complicated by several factors. In any determination of radiation effects, whether in working populations or in animal experiments, the following factors must be considered: (1) the location of specific isotopes in the body, and (2) the relative sensitivity of different tissues to radiation.

The general effects of external radiation have been previously described but there are certain modifications in the consideration of radiation from internal sources. The first is that different elements tend to localize in different organs of the body, e.g., calcium or strontium in bone, iron in the red blood cells, and iodine in the thyroid. This is true for any material which is metabolized following either inhalation or ingestion. Of course, any not readily soluble substances will remain in the lungs for long periods after inhalation. This means that the total amount of such a radioactive material is not contributing its dose uniformly but rather is concentrating its effect on a relatively small fraction of the body. Most of the heavy metals tend to be deposited in the bone structure. After deposition, there is usually a continuous excretion of the isotope which gradually reduces the amount present. The excretion rate of such materials has been considered to follow much the same pattern as the radioactive decay of an isotope. The time required by the body to eliminate one-half the total quantity it contains is thus referred to as "biological half-life." Most of the experimental data on excretion seem to fit a power function which is the resultant of a number of exponentials rather than a simple exponential function, but the concept of biological half-life is still used in deriving permissible levels.

Such body deposits may depend on many physiological factors both in the process of deposition and of excretion. For many years a high calcium diet was recommended for radium workers, as it was supposed that a large excess of calcium entering the body would reduce the amount of Ra deposition. Actually, the relative radium deposition is a function of the ratio of radium to calcium in the blood stream. Unless the calcium level of the blood is maintained at a very high value there will still be deposition of radium. The increase in the blood calcium required to cut the radium deposition by even a factor of three would be impossible to attain.

Besides the bone structure, common sites of deposition are the lungs and lymph nodes for inhaled particles, and specific organs for certain isotopes, such as the thyroid for iodine and spleen for iron.

A second consideration is that certain organs or tissues are more radiosensitive than others. The membranes lining the bronchi are supposedly quite sensitive to radiation and this is the primary site of many lung cancers attributed to inhaled radioactive material. The spleen is also sensitive to radiation and relatively small doses have produced more irreversible damage in that organ than in other parts of the body.

The organ most likely to be damaged because of the combined effects of concentration and radiosensitivity is known as the critical organ for a particular isotope. In general, any cell in the process of division (mitosis) is radiosensitive and for that reason a person is more sensitive to radiation during his growing period than as an adult.

Radiation Injury. The effects of radiation are nonspecific; i.e., other agents or diseases can cause the same damage. For example, it is impossible to distinguish between radiation-induced anemia and normally incident anemia. Other possible effects such as lung cancer, leukemia, and bone cancer present similar difficulties.

In any case, where the effects of radiation are being studied, conclusions can only be drawn on the basis of incidence of a particular type of damage above that normally occurring in a comparable population. If tabulations are made of incidence in a particular group, such as chemical operators exposed to radiation in a process

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State Representative Stephen Reed's Letter to the NRC

August 8, 1979

Honorable Joseph M. Hendrie, Chairman
U.S. Nuclear Regulatory Commission
Washington, District of Columbia

Dear Chairman Hendrie,

I am entirely baffled by the apparent refusal of the U.S. Nuclear Regulatory Commission to have extensively reviewed the reports by hundreds of Three Mile Island area residents who, during March 28-31, 1979 primarily, and at times subsequent, experienced:

(a) metallic taste in their mouth
(b) metallic or Iodine-like odor in the air
(c) irritated and watery eyes
(d) moderate or severe respiratory inflammation
(e) gastro-intestinal dysfunction and diarrhea
(f) disruption of the menstral cycle in females
(g) skin rashes (some appearing as radiation burns)
(h) sharp, abnormal pains in joints.

The U.S. Public Health Service and Pennsylvania State Dept. of Health are jointly conducting a survey of TMI area residents to record medical histories so that the full health consequences of TMI' radiation releases in the next 25 years will be documented. That is all fine and should be done. But why is there a complete dismissal by the NRC of any immediate indications of exposure to levels of radiation higher than what were immediately thought the first dates of the accident? Psychosomatically induced ailments are possible with some, but not with hundreds or even more persons and I suggest this matter has been conveniently laid aside.

The NRC is charged with ascertaining full details about the TMI accident. You are further charged with knowing the full effects of even low level radiation on populations near to nuclear reactors. Failure to pursue the aforementioned reports from TMI area residents is a dismal failure of your most important safety responsibilities to the tens of millions of people living near reactors, not to mention the people around TMI.

I therefore recommend that all available expertise be applied to ascertaining the cause of these physical ailments associated with the TMI accident and a completely accurate public disclosure made of its cause and the level of radiation or contamination that people may have been exposed to. The inability of both Metropolitan Edison and the NRC to know even to this day (or at least to have disclosed if you actually do know) the levels of exposure is in itself a major, most serious failing of pre-TMI accident obligations by both parties. And if it is determined that the exact cause of these physical ailments cannot be determined due to the lack of adequate research on the subject pre-TMI, then the public should know the extent to which we indeed are unprepared to deal with nuclear plant emissions.

Yours sincerely,

STEPHEN R. REED
State Representative

Publications of James E. Gunckel

The Effects of Ionizing Radiation on Plants: Morphological Effects, The Quarterly Review of Biology, Vol 32, No. 1, March 1957

Modifications of Plant Growth and Development Induced by Ionizing Radiations, Encyclopedia of Plant Physiology, Vol XV/2, 1965

Aberrant Growth in Plants Induced by Ionizing Radiation, with Arnold H. Sparrow, Abnormal and Pathological Plant Growth, Brookhaven Symposia in Biology No. 6 (1954)

Ionizing Radiations: Biochemical, Physiological and Morphological Aspects of their Effects on Plants, with A. H. Sparrow, Encycylopedia of Plant Physiology, Vol XVI, 1961

AFFIDAVIT 1

On April 24, 1984, I, _____ provided the following information in response to a questionnaire presented by Francine Taylor of Lancaster, Pa. and to Marjorie Aamodt in a subsequent interview that same day. I also provided Ms. Aamodt with a letter which was addressed to Governor Thornburgh and is dated November 19, 1981. I never received an answer to this letter. The letter is attached to this affidavit and is to be considered a part of it.

At the time of the TMI accident, I was living at _____ not far from my present home. This area is approximately four miles northwest of TMI. Concerning my experiences following the accident at TMI: On Thursday, March 29, 1979, I was working all day with my son in

our garage. The garage doors were open. That night when I took a shower, my face, neck and hands looked like I was at the seashore and got burned real bad. I felt nauseous. My eyes were red and burning. I felt like I was looking through water. Friday morning when I got out of bed, my lips and nose were blistered, and my throat and inside my chest felt like fire. It tasted like burning galvanized steel. My son had similar experiences. He was 22 years old at the time. On Friday we decided to evacuate. While packing our truck, a township police officer, in a closed car, shouted over his loudspeaker system, "Bill, don't breath this air. Get inside". We spent the first night in Mechanicsburg with relatives. We convinced other family members to go with us and traveled to Front Royal, Va. on Saturday. We stayed at a camp ground in Front Royal for about one

week. During this time I experienced severe diarrhea which caused rectal bleeding. We took one of our dogs with us, a German Shepherd, female. Following our arrival in Virginia, the dog passed only blood from the rectum and bleed from the nose and mouth. Since I felt that these conditions may have been caused by nervousness due to our flight, I gave her a sedative. When we returned home, we went in the garage first and found our male German Shepherd had died. His eyes were milky white. We had provided about 100 lb. of food and 50 gallons of water, however, he had only drunk water, about five gallons. It appeared that he had thrown up some of this water before he died. We had five cats that lived in a box on the back porch. All but one was dead. All cats had milky white eyes. The one living cat had one eye that was milky white: skin grew over this eye during the

following weeks. This cat lived for about six months after the accident. She had kittens prior to her death. The kittens were born dead and hairless I should also note that we noted a metallic taste when we entered our home after the evacuation.

My son and I have both experienced hair loss; mine was on my head, arms, legs and torso. This hair has regrown. My son lost hair on his arms and torso, which has also regrown. In 1981 a sore developed on my leg. The sore remained for two years, healing after we moved to Florida. The inflammed, open, and raised; the doctor's diagnosis was uncertain. Also in 1981 my wife, was diagnosed as having paroxyamal tachycardia and 1982 as having an underactive thyroid. I have also experienced problems with my heart. Although I had had a slight murmer prior to the accident, I had passed a physical required for racing cars. However, in

December 1980 I needed to undergo an aortic valve replacement. I was 43 years old at the time.

The spring following the accident, our walnut trees did not produce any leaves and there were no walnuts. There were no flies or other flying insects until July 1979. There were no birds, squirrels or pheasants for about a year and one-half following the accident. I found a number of dead birds. A number of neighbors died of cancer.

In 1983, I felt that I could not continue to live in this neighborhood, so close to The TMI plants. I sold my home and business at considerably less than its appraised value and moved to Florida. However, we returned this year and are living in a new home at _____, near our previous home. We got homesick. My daughter and grandchildren live in this area, as well as other relatives, and

telephone communication with them was not sufficient contact. My son left with us for Florida and has stayed there.

I had been in business in Fairview Township, York County, for twenty-two years. I operated an automobile sales and service shop. I was involved in community affairs as a justice of the peace and in politics as a committeeman.

All of the above information was provided voluntarily, and I attest to its truthfulness.

AFFIDAVIT 2

On May 5, 1984, I, _____, provided the following information to Marjorie Aamodt at my place of residence on _____. My residence is approximately 2-3 miles south west of TMI and is at a high elevation.

On Monday evening, April 2, 1979, after returning from West Virginia where I had evacuated with my family, I worked outside on my camper from approximately 6 until 7 p. m. My family stayed inside. When my wife called in for supper, my skin was burning. My face, arms and hands were reddened and remained that way for about 12 hours. I had a metallic taste. I felt nauseous. I felt "funny in the head". I took a shower that evening before going to bed. Since I had a head cold, I went to the doctor's the next day. I told my

doctor about my experiences the following evening. He read from a book what symptoms matched what I had experienced, however the doctor reassured me that nothing had come our experienced, however the doctor reassured me that nothing had come out of the plant. Concerning the weather conditions on the Monday evening, April 2, 1979, I remember that there was a light mist over the area.

AFFIDAVIT 3

I, _____ provided the following information to Marjorie Aamodt in a telephone conversation on June 18, 1984. I was ill with flu at the time of the TMI accident. I was in bed most of the time. However, one day, which I believe was Friday, March 30, 1979, I was out of bed and decided to shake out a throw rug. I went out on the porch. It sounded as if it was raining. The sound appeared to be in the trees. I could not see any rain so I reached out beyond the porch roof to try to feel it. I did not feel any rain on on my hands or arms. I was extremely puzzled, I was impressed by the stillness except for the sound of rain. There were no sounds of birds or other sounds to which we are accustomed. This all seemed very strange, however I

was too sick at the time to pursue the matter further, so I returned to bed. My certainty in dating this event on March 30, 1979 is tied to a telephone call I received later that same day. A neighbor called to tell me that my son had been taken from his school to Dillsburg because of the TMI accident, and she volunteered to pick him up.

I could never get the experience of the silence and the rainlike sound out of my mind. Subsequently, several of my friends told me about similar experiences at the same time. One of these friends is _____.

I and my sons remained during the accident. We would have chosen to leave, however I am a widow, and I did not have sufficient financial resources to leave.

AFFIDAVIT 4

On April 28, 1984, at my home, _____, I related the following experiences that I had at the time of the accident at TMI. ON Wednesday evening, March 28, 1979, unaware of any problems at the TMI plants, my wife and I were outside in the evening to take a walk on our street. The walk lasted approximately ten minutes. That evening, my eyes began to water and burn. My eyes watered throughout the entire night.

In the fall of 1982, I began to have problems with my eyes. My eyes felt like they were burning. About three months after this occurred, I decided to see a doctor. At this time the skin around my eyes was irritated and red, and there was a distinct red mark on the innerside of my nose. Although the redness around my eyes

has disappeared, the mark on my nose has remained.

The first doctor appeared unable to help, and since I was troubled about my eye condition, unique to me during my lifetime, I saw a second doctor. I also had a rash on my forearms which had come and gone since shortly after March 1979. This rash is particularly prescribed after showering and in warm weather. The dermatologist prescribed Prednizone.

In 1981, my wife _____ was diagnosed as having fibroid tumors in her uterus. These tumors were large, but were successfully removed in September of 1982.

I believe that my skin conditions and possibly my wife's tumors are related to some exposure we may have gotten from the accident at TMI. We were unaware of the problems there or any dangers to ourselves until several days after the accident. Actually, it was a TMI worker who is a

neighbor and who evacuated early on the first day of the accident who returned on the weekend to warn his neighbors to evacuate.

AFFIDAVIT 5

On Friday, April 29, 1984, I provided the following information to Marjorie Aamodt in my dental office in _____, Pa., located at. This information concerned my experiences on Wednesday and Thursday, March 28 and 29, 1979. On those days, I discovered that the X-ray films in my dental office in, Pa. were fogged. This office is located on the corner of _____ in a stone building 5 miles north west of TMI. the film fogging can be described as alternately light and dark banding across the entire film. Approximately 75 films were "fogged". These films had been placed in a little container for easy access in the X-ray room. The X-ray room has an outwall of cinderblock and gypsum board. The film is #2 oral film, fast D film, 0.2

mr exposure. The machine is marked as 70 KV, 7.5 m. amps, 3/10 sec., for jaw exposure. On Friday following, March 30, 1979, I posted new film outside the building each day for an entire week, however these films were not exposed. On Wednesday and Thursday, March 28 and 29, 1979, I experienced this feeling to my a queasy stomach. I felt "funny" and expressed this feeling to my receptionist. At that time I had no knowledge of the accident at TMI.

AFFIDAVIT 6

I, _____

provided the following information to Jane and Marjorie Aamodt on May 11, 1984.

On Friday evening, March 30, 1979, I was standing on the front porch of my home. My home faces south. It was raining, and the wind was blowing. All of a sudden the cat that had been let out began to howl in a most unusual way. I had never heard a sound like that from this or any other cat. I called the cat by name, however it did not come home. From the direction of the howling, I could tell that the cat was under the porch. I went over to the bannister and leaned over to call the cat again. While standing in this position at the east side of the porch, I experienced a most unusual sequence of events. Suddenly, the wind

stopped; there was a movement in the limbs of the trees next to the porch, and a wave of heat engulfed me. The gust of heat brought the rain over me. Then the wind started again. This all happened in about one minute. I was so startled that I went in, taking the cat, who had by now come up on the porch. I wiped the cat's wet coat and then washed my hands and face. My face felt tingly. About an hour later, I washed my face again and wiped my arms and legs with the towel. I noticed that my arms and face were pink. I applied a lotion because my skin felt tingly.

On Saturday morning, my skin was a darker pink, and there was an itch at the front of my scalp. This was the only part of my scalp that was not covered by a scarf. When I went to church on Sunday, my friends commented that I looked healthy and sunburned. On this day, hard little lumps, a little bigger than a pinhead

appeared on my forehead and into the hairline.

On Tuesday, my scalp felt prickly and tingly, so I washed my hair again, shampooing it three times which is more than I customarily do. (I generally wash my hair once a week.) About three weeks later, I noticed that a lot of gray hairs had appeared across the front of my hair. When I washed my hair that week, my comb was full of hair. The next week, the loss of hair increased. I called my hairdresser, who subsequently applied treatments which he believed would arrest the loss of hair. The hair loss did appear to stop. The gray hairs have also disappeared, and my hair is now uniformly brown as it was before the events described.

In the subsequent weeks, the skin on my forearms and neck turned darker and was scaly. This condition lasted for several

years. There is however some permanent discoloration however it not prominent. My forearms were, and continue to be, very sensitive to the sun, becoming itchy with exposure. I try to avoid sunlight. I have also noticed that if my arms are injured, the bruise will last longer than was normal for me prior to the events discribed above.

A number of spots have appeared on my face and chest. These appeared after the tiny hard bumps went away. Six of these spots, or pimples, remain. Some of the pimples have yellow centers. The size of these pimples appears to have diminished somewhat, and they are not sensitive, however I am uncomfortable with this condition of my skin, unlike its condition prior to the events described above.

Of greatest concern to me presently is the loss of the function of a kidney. Toward the end of November 1983, I was in

rental failure. My doctor described my condition as an unusual case. He stated that one of my kidneys had died. I was in Holy Spirit Hospital under the care of Drs. Bean and Eaton. I have not fully recovered, and I have not been able to resume my customary social and household activities.

I live on a farm with my husband. We were not able to evacuate during the accident, although I wanted to leave, because my husband would not ask anyone else to stay to do his job of caring for the animals. Despite our continual attention to the cattle, we experienced the first deformed calves ever born on our farm the following spring. The calves' heads hung to one side until they were six months old. Their necks appeared twisted. I also noted that the Norway maple by or home had deformed leaves which were curled at the edges.

AFFIDAVIT 7

I, _____ reside at _____ six and one-half miles north northwest of TMI. This was also my residence at the time of the TMI accident as well as that of my husband, son and daughter.

On the morning of March 28, 1979, my husband was putting his tools into his truck. It was six o'clock in the morning when he came in to ask me to go out and smell the air. I wondered to myself whether it would be the Hershey chocolate smell or the aroma of Capitol Bakers' bread. This time the air was different. the air smelled like metal. It was overwhelming. I could taste metal in my mouth. It seemed as though as every taste bud in my mouth could sense this metal. We were very puzzled.

Later that morning, at 8 o'clock, my

son and I walked my daughter to the bus stop. There was no metallic smell in the air.

AFFIDAVIT 8

I, _____ of _____ provided the following information to Jane Lee, a neighbor, and Marjorie Aamodt at my home on Monday, May 7, 1984. I provided this information voluntarily and attest to its truthfulness.

My home is approximately 2 miles from the TMI plants. My house faces in that direction and is north west of TMI. I have several trees in my frontyard. One of these, a maple at the south corner of the yard next to a wooden fence appeared to be affected by the accident at TMI. This tree is about 30 years old and is still living, however it has undergone considerable changes. About a week after the accident, I noticed that the leaves in the center of the tree were turning brown. The leaves then dropped off leaving a circle of

defoliation about twelve feet in diameter. The next year the barked dropped off many branches. This caused these branches to die. About one-fourth of the limbs are now gone. The top of the tree, which was the area that was affected after the accident, now has few leaves. Two pear trees, one a Keifer and the other a Havest, both planted in the late 1920's, have died. Six trees had been good bearing trees prior to the accident, however they all produced dwarfed pears after the accident. The number of pears decreased also. Since the accident, I can no longer grow clover seed because the clover yields so few seeds. In 1981, the last year I grew clover, there were only 0-10 seeds per stem, whereas I got about 75-125 seeds per stem before the accident. This problem has affected other farmers in my area, but is not a problem on a farm in this area but at a greater

distance from the TMI plants, approximately 12-15 miles. I attribute the decrease in seed production to the disappearance of bumble bees that pollinate clover. Last year we had no apples from our 3 trees. One apple tree, in the yard, started 'going back' after the accident. Last year, it only had a couple of leaves, three blossoms and no apples. The only crop that 'does good' is potatoes. We have had a number of problems with livestock including sows that did not come into heat. These sows were not born on my farm, but were purchased from a farm near here.

I was inside my house on the day of the accident and stayed in most of the time. I have a rash 'back of my ear' and down on the side of my face ever since the Krypton venting began.

I have lived in this area all of my life and have farmed since 1912.

Addendum - The leaves on my garlic plants curled tightly and the plants died. This happened in 1979 after accident.

AFFIDAVIT 9

I have carefully examined a few specimens of common plants collected shortly after the accident at TMI and compared them with specimens collected more recently. The current abnormalities are probably carried forward by induced chromosomal aberrations. There were a number of anomalies entirely comparable to those induced by ionizing radiation -- stem fasciations, growth simulation, induction of extra vegetative buds and stem tumors.

Most of the stem abnormalities described in the literature, and in my own experience, are induced by relatively high doses of Z or gamma rays extending over a period of usually 2-3 months. Notable exceptions, however, are similar responses to beta ray exposure from radioisotopes

(^{32}P, ^{65}Zn, ^{45}Ca) and for only 24 hours. In other words, it would have been possible for the types of plant abnormalities observed to have been induced by radioactive fallout on March 29, 1979.

In discussing the general biological effect of irradiation, some clarification may be helpful. In plants, the dose rate (e.g., mr/hr) is much more important than total dose (e.g., mr/yr) in inducing abnormalities. Further, the "quality factor" for gamma and beta radiation is not the same as generally assumed. In fact, I have incontrovertible experimental results to show that beta rays are at least a quality factor of two in plants.

I am the world authority on modifications of plant growth and development induced by ionizing radiations, having researched this area

for 34 years at the Brookhaven National Laboratory and at Rutgers University. The three review papers appended attest to my expertise.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE COMMISSION

In the Matter of

METROPOLITAN EDISON
COMPANY, et al. Docket 50-289

(Three Mile Island Nuclear
Generating Station, Unit 1)

AMENDMENT TO AAMODT MOTION OF JANUARY 15, 1985 ADDITIONAL HEALTH MATTERS WHICH MUST BE CONSIDERED PRIOR TO THE COMMISSION'S DECISION ON RESTART OF UNIT 1

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April 13, 1985

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Exhibit 1 - Department of Energy 10-Mile Exposure Profile (mR) for

the Period March 28 through April 3, 1979.

Exhibit 2 - "Judge OKs $3.9 Million for TMI Suits", The Evening News, February 7, 1985
"17 County Youths to Get $181,700 in Settlement over TMI Accident", New Era, March 6, 1985.

Exhibit 3 - "A Time for Sharing and Caring" Extra, March 20, 1985

Exhibit 4 - Radiobiology for the Radiologist, pp.65,70-73

Exhibit 5 - Diagram - Location of Core Mate
Transcript, pp. 27, 28, Commiss
Meeting, November 7, 1984

Exhibit 6 - "Accident without an end", The Philadelphia Inquirer, section of pp. 7, Special Edition

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1.0 Abstract

On June 21, 1984, the Aamodts reported to the Commission that their findings of serious health effects in residents in the direction of early plumes from the TMI accident clearly indicated that a comprehensive investigation was warranted prior to the restart of Unit 1. The Commission denied the Aamodt's motion on December 1984, following the NRC Staff's direction and a cursory review by the Centers for Disease Control. Commissioners Bernthal and Assesltine provided dissenting opinions.

On January 15, 1985, the Aamodts asked the Commission to reconsider its decision since the 600% increase in cancer mortality in the areas surveyed had been verified. Other scientists, the TMI Citizens' Advisory Committee and Senator Arlen Specter also asked the Commission to

reconsider the Aamodt motion.

Although there has been no ruling, the Commission has publicly stated that it may initiate an investigation of health effects. However, it appears that the Commission would not delay its decision on restart of Unit 1.

The Aamodts believe that the Commission must determine, prior to its Unit 1 restart decision, the cause, extent and scope of the TMI-area residents' health problems and environmental injury. Serious health effects as far as 30 miles from TMI appear to be accident-related and challenge the NRC's emergency planning for the 10 mile radius of TMI. The Aamodts have argued that since the people, flora, animals and insects were the true dosimeters, the dosimetric hardware and techniques, presently in use, have been demonstrated to be inadequate to protect the public and environment. In fact,

residents in one area northwest of TMI are presently experiencing effects which appear tc be the result of residual radiation from the accident, however, the agencies responsible for the protection of public health and safety claim that they are not able to identify causative radioactivity or any other agent.

The recently-acknowledged 5,100 degree temperature that the core of Unit 2 reached during the 1979 accident released transuranic materials from the core. These materials emit a type of radiation (alpha) which was not measured at the time of the accident, which is difficult to detect, which cannot be detected by the standard kind of dosimetry presently installed for the protection of the public, and which is highly hazardous.

Transuranic materials were probably released to the environment during the TMI accident, a matter which would challenge

the legitimacy of further nuclear operations in the area. GPU admits that two to eleven tons of the Unit 2 core are missing, and transuranics were found in Unit 2 filters analyzed in 1980. The withholding of this information further calls into question the integrity of GPU management and NRC regulation of Unit 1.

GPU, in its pay-out of nearly four million dollars so far this year, has essentially admitted that TMI-area residents have been severely damaged by the TMI accident. A number of these residents reside beyond the 10 mile radius for which emergency planning has been provided. Over 300 additional personal injury claims have been filed. It can be assumed from these numerous claims and the findings of a 600% increase in cancer mortality west of TMI that the TMI accident was a disaster of undefined proportions.

GPU's imposition of a 'gag' on claimants in return for out-of-court compensation will block access to information needed in a comprehensive investigation of health effects from the accident unless a challenge is made in the public interest. If Unit 1 is allowed to operate, prior to the full resolution of the extent and nature of the radiological impact from the Unit 2 accident, TMI-area residents may again experience additional serious physical injury from an accident at Unit 1.

Any further delay by the Commission, relative to the fair and independent resolution of the health effects in the TMI area, would provide cause for criminal prosecution of the commissioners. In the event that the Commission should act to restar Unit 1 prior to a fair resolution of health effects in the TMI area, legal action to remove the consenting

commissioners would be appropriate.

2.0 Introduction By memorandum of March 14,1985, we notified the Commission that serious post-accident health problems in persons residing beyond the 10 mile EPZ (emergency planning zone) for TMI must be included in a comprehensive investigation of health effects and that this investigation must precede the Commission's restart decision. The matter of serious post-accident health effects within and beyond the 10 mile radius of TMI challenges the presently-approved emergency plans. While the Commission now appears to be softening its attitude toward the initiation of a comprehensive investigation of post-accident health effects in the TMI-area residents, the Commission has signaled its intention to proceed with its decision on restart of

Unit 1 prior to any investigation.[1]

The Commission's apparent change in attitude toward our motion for an investigation of the health problems is commendable, however a restart decision would be premature -- and illegal -- if it precedes a health investigation.

The Commission must determine the extent of personal and environmental injury caused by the TMI accident prior to a decision on restart of Unit 1, whereby further radiological injury is premised. The Commission must determine whether the emergency plans developed on the basis of the totally false assumption that noone was injured, are adequate to protect a seriously-injured population.

The recently-acknowledged facts, that the TMI-2 core temperature exceeded 5000 degrees (farenheit) and that transuranic

[1] See transcript of Commission meeting with Citizens' Advisory Committee of March 7, 1985.

materials were found in filters, were not considered in planning protective actions for the public. In addition, the late admission by GPU of the extensive core damage, despite the telling evidence of transuranics in the filters, poses even more serious questions concerning the trustworthiness of the present management. The six year delay in any reasonable assessment of the severity of the accident, and the present reluctance to face the public health issues, by agencies that knew or should have known has raised the issue of the adequacy of the oversight and regulation of nuclear operations at TMI --or anywhere.

3.0 Health Effects Beyond 10 Mile Radius of TMI

The data is of three types. The first (presented in Section 3.1 and Figures 1,2) was routinely collected by the Pennsylvania Department of Health

(PDOH) to ameliorate the effects of hypothyroidism in infants less than 28 days old (neonatal). The 1979 and 1980 data for Lancaster County is not new information, however a reinvestigation is now warranted in view of the significant drop in cases from 1981 through 1983. This drop was not expected by Licensing Board, in separating the 1979 hypothyroidism incidence from the TMI-2 accident. See PID, December 14, 1981, Para.1721.[2] If the

[2] The Licensing Board's Chief argument was that since the "rate of neonatal hypothyroidism in Lancaster County remained high in the first nine months of 1980, long after radioiodine releases from the TMI-2 accident should have ceased...the increased rates in Lancaster County after the TMI-2 accident, were not a result of that accident." (The Board's assumption that the venting in 1980 was void of radioiodine is naieve.) The Board did not have have other credible evidence since it "was not convinced as to Dr. Tokuhata's (PDOH witness and chief epidemiologist) radiobiological expertise and understanding of genetics on which his conclusions regarding health effects were based." Id. Para. 1722.

1979 cases were the result of radioiodine releases from the TMI accident (as appears to be the case, the distances of the residences of these cases, as far as 35 miles from TMI, challenge the concept of emergency planning for the 10 mile radius.

The second set of data was provided, individually and spontaneously, by the affected persons after our motion of January 15, 1985 was reported in the news media. Although the data is sparse in comparison to the potentially-affected population, we consider the cases reported as representative of a large number of existing, unreported cases.[3]

[3] Since we have moved and have an unlisted telephone number, we can assume that many more people tried to reach us. The fact that these did, emphasizes their conviction. Residents within the 10 mile radius, in the areas surveyed last year, have called to report an additional 31 deaths and 46 cancer/tumor diagnoses in the area and nearby.

This data is presented in Section 3.2 and Figure 3. Its significance is its credibility (it is consistent with data concerning health effects within the 10 mile radius and, in a relative fashion, with radiation measurements made during the accident) and the distance of the affected beyond the 10 mile EPZ.

The third kind of data was gleaned from newspaper accounts of personal damage suits which GPU has tacitly admitted were valid in settling out-of-court for nearly four million dollars. At least seven of the personal injuries were to children who reside beyond the 10 mile EPZ. This information is presented in Section 3.3 and Exhibit 2.

3.1 Neonatal Hypothyroidism Cases in Lancaster County

The significant drop in cases in the years 1981-1983 strips away the Licensing Board's (see Section 3.0 supra) and the

PDOH's bases[4] for claiming that the 1979 incidence was not caused by the TMI accident. The 1979 data represent a tenfold increase in incidence over that expected (according to national averages (1 case/4000 - 5000 births). With approximately 3000 births, annually, Lancaster County should report one or no cases per year (o.06 - 0.07). The higher than expected rate in 1980, which misled the Board into believing that incidence in Lancaster County was routinely above the national expected, and can be attributed to the venting of TMI-2 containment gases in 1980.

The number of cases are provided by year in Figure 1 and plotted by

[4] Dr. Tokuhata has continued to attribute the high incidences of hypothyroidism in 1979 to genetic defects among the Amish, reiterating this absurdity as recently as this past fall in addressing a professional conference. Oral Presentation at the XII International Biometric Conference, September, 1984 (written version provided by PDOH).

geographical location of residence in Figure 2.

FIGURE 1 - NEONATAL HYPOTHYROIDISM CASES IN LANCASTER COUNTY

Year	Number
1979	7
1980	4
1981	2
1982	0
1983	1

The geographic distribution of the six (post-accident) cases (shown in Figure 2, pp. 7) falls into a line in an east southeast direction from TMI, suggesting the impact of a plume from TMI.

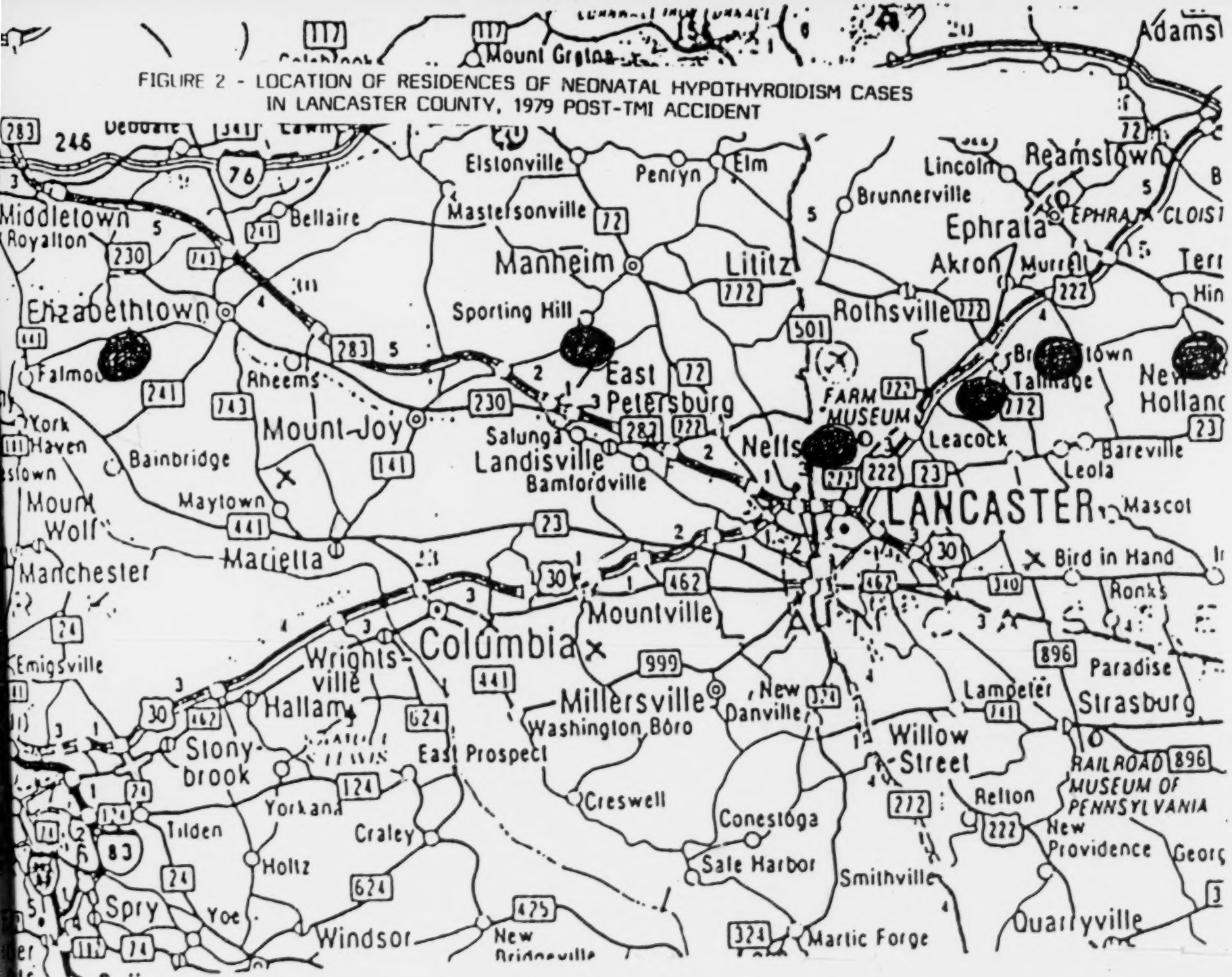
Although one case was as close as approximately five miles from TMI, the other five cases resided from 15 to 35 miles from TMI, or well outside the 10 mile EPZ.

Since the Board's and PDOH's explanations of the high incidence of hypothyroidism in 1979 in Lancaster County has been refuted by the evidence of normal incidence in 1981 - 1983, the identification of the geographical locations of the 1979 cases as far as 35 miles from TMI, as well as the high incidence throughout southeastern Pennsylvania in 1979, must now be investigated for its implications concerning emergency planning.

The most recent study of the TMI-2 inventory hs only accounted for between 17 and 28 percent of the radioiodine.[5] Extrapolations of iodine release from milk sampling has been shown to be too low by a factor of 50 because of an error of

[5] Pelletier, et al., "Preliminary Results of the TMI-2 Radioactive Iodine Mass Balance Study, Transactions Vol 43, American Nuclear Society Meeting, Winter 1982, Washington, D.C.

FIGURE 2 - LOCATION OF RESIDENCES OF NEONATAL HYPOTHYROIDISM CASES IN LANCASTER COUNTY, 1979 POST-TMI ACCIDENT



assumption that cows were on pasture.[6] In addition, milk sampling at distances where hypothyroidism occurred was essentially non-existent.

The more reasonable interpretation of the hypothyroidism incidence in 1979 would be to consider exposure of pregnant women to radioiodine from the accident. The incidence was in Lancaster County where the Amish pregnant women were working in the fields (as is the practice) and consuming fresh milk from the pastured family cow.

The NRC Staff withheld a study which it commissioned to determine the pathway of radioiodine to milk.[7] This study, which established the pathways as totally to

[6] Beyea, "A Review of Dose Assessments at Three Mile Island and Recommendations for Future Research, August 15, 1984, C-55, Table C-5.

[7] Beyea, (Id.) pp. C-53.

inhalation,[8] if considered in the restart proceeding, would have held the Licensing Board to different conclusions concerning hypothyroidism data.

3.2 Recent Reports of Health Effects Beyond 10 Mile EPZ

The persons who provided the following information believe, independently of any outside information, that the injuries that they have described are totally attributable to the accident at TMI.[9]

[8] Baker, et al., "Pathways of Iodine-131 to Milk Following the Three Mile Island Incident", Letter Report to NRC, Battelle Memorial Institute, Pacific Northwest Laboratory, Richard, Washington, June 1983.
(The Study had been completed eighteen months earlier.)

[9] Since the time of the accident, people who had problems associated with TMI have met with denigrating official and medical reaction. The official position that 'not enough got out' was promoted by GPU among the local medical practitioners. GPU hosted the TMI area physicians, after accident, to inform them

3.21 Serious Post-Accident Health Effects Beyond 10 Mile EPZ Spontaneously Reported

A description is provided and identified geographically on Figure 3 by corresponding letter.

(A) A baby, conceived within two weeks of the accident, with the following abnormalities: a single eye located in the center of its forehead and hydroencephalus; died following full-term birth.

(B) Five cases of leukemia within a mile; one person in mid-30's died in March, 1985.

(C) A 31 year old woman with hypothyroidism and leukemia.

(D) Four infants born in the same

---

that any medical indications or radiation damage that they might observe in their patients could not be attributable to physical damage from the TMI accident. It is believed that NRC personnel participated in this effort.

month with Downs Syndrome; incidence considered abnormally high by physician; one/year expected, (this hospital).

(E) Three carpenters, working outside near the city of Lancaster, experienced metallic taste during the initial days of the accident; two developed lipomas.

(F) Siblings were diagnosed as having an identical mysterious blood disorder in May 1979.

(G) Dandelion leaves over 3 feet long grow in profusion in a school yard.

(H) A secretary in the Capitol building experienced metallic taste, nausea and severe vomiting on the first day of the accident, causing her to leave work and seek a physician's advise.

(I) A woman (less than 35 years old) has hypothyroidism and cancer of the cervix.

(J) A young woman has experienced a spontaneous abortion, death of an infant

and a recent diagnosis of breast cancer.

(K) Cancer cluster.

3.3 Serious Health Effects Beyond 10 Miles Acknowledged by GPU's Payout of Nearly 4 Million Dollars

On February 7, 1985, a Dauphin County judge approved awards of nearly four million dollars to persons claiming they "most probably came into physical contact with some radioactive debris" which "was dispersed throughout a large area." See Exhibit 2 attached. Information concerning the exact nature of the injuries claimes was not provided (except in the case of a Downs Syndrome case) because GPU required silence on the part of the claimants in return for the out-of-court settlements. Except for thirteen claimants, the addresses were not provided. Of those, seven residences are outside 10 mile radius of TMI. Seven live in Mt. Joy and Columbia, southeast of TMI,

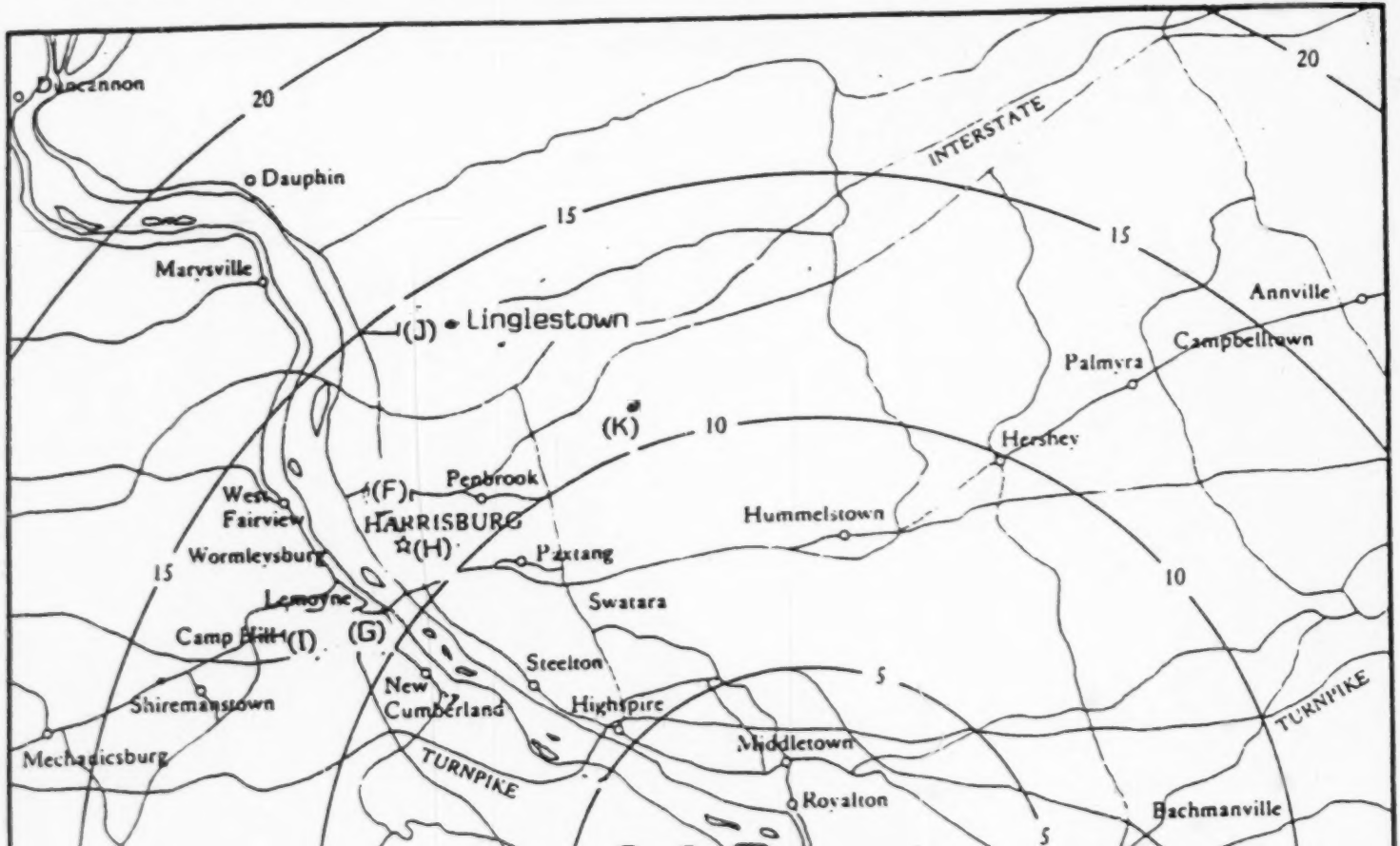
and one in Harrisburg, northwest of TMI, the two general directions where the majority of the serious cases plotted in Figure 3 also reside. Additional confirmation of plume impact in these directions is provided by the door-to-door survey results reported in the Aamodt motion (two areas were west northwest of TMI) and "clusters" such as the one reported in Maytown. See Exhibit 3, attached.

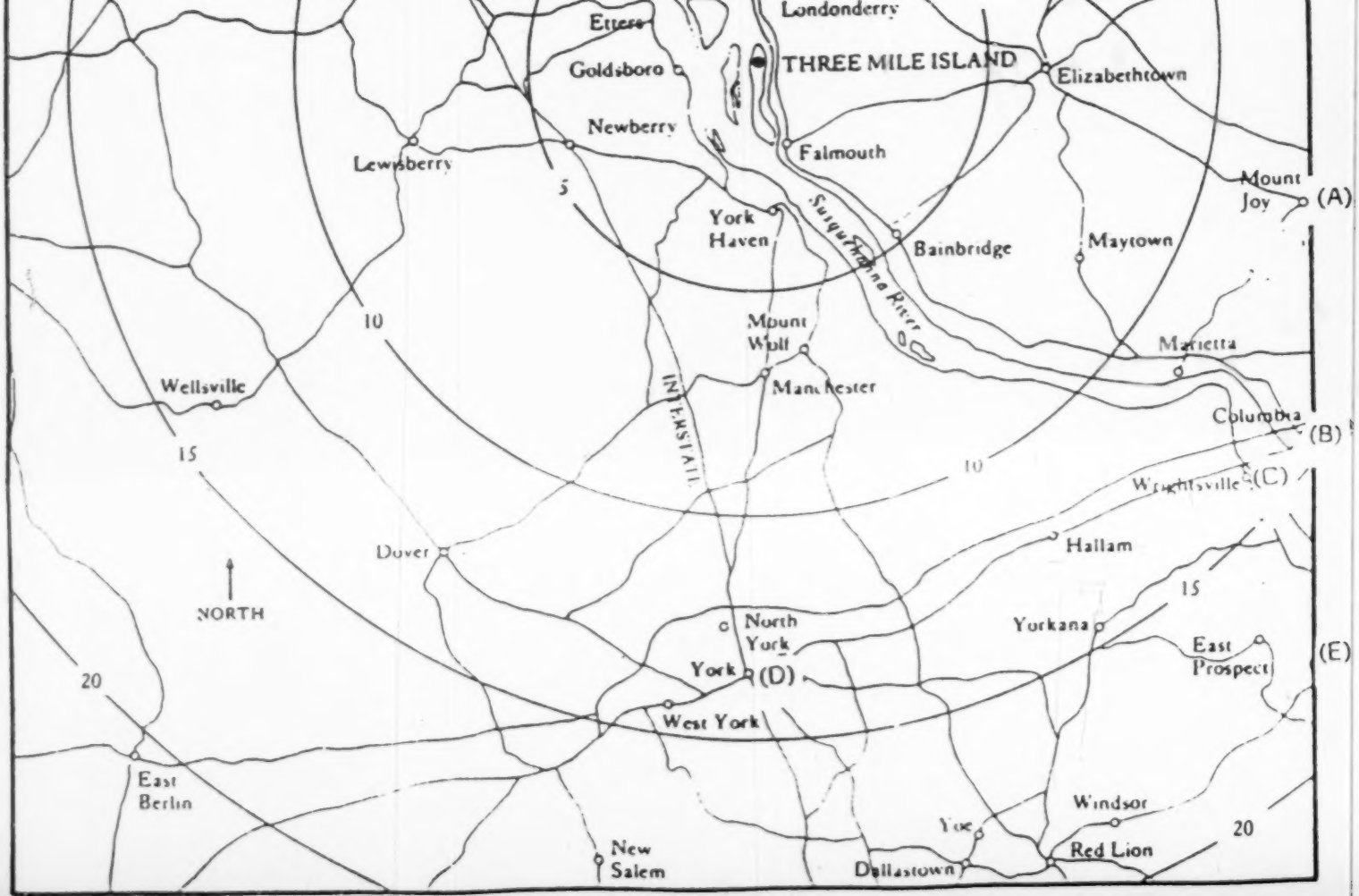
The juvenile cases came to notice of the press because they required approval of the court. GPU has admitted that "300 personal injury claims" were being settled out of court, essentially an admission of guilt and unethical silencing of the accuser.

4.0 Evidence of Radiation From TMI Presently in Environment

4.1 Measurements West of TMI By Agencies

FIGURE 3 - PLOT OF REPORTED SERIOUS HEALTH EFFECTS BEYOND 10 MILE RADIUS OF TMI




Londonderry
Ettere
Goldsboro
THREE MILE ISLAND
Elizabethtown
Newberry
Falmouth
Lewisberry
5
Mount Joy
(A)
York Haven
Susquehanna River
Bainbridge
Maytown
10
Mount Wolf
Marietta
Wellsville
Manchester
INTERSTATE
Columbia
(B)
15
10
Wrightsville
(C)
Dover
Hallam
NORTH
15
North York
Yorkana
East Prospect
(E)
20
York
(D)
West York
East Berlin
Windsor
Yoe
20
New Salem
Dallastown
Red Lion

On August 15, 1985, during a meeting with the Commission, we reported that we measured radiation on top of the ground ten times air level west of TMI. (The instrument used was a Victorine handheld owned by a local resident). This measurement was checked by use of the Newberry Township meter (also a Victorine). The result obtained were the same (0.1mr. gamma). These readings were made in May 1984. Subsequently, on August 30, 1984, at the request of William Travers of the NRC field office in Middletown, PA. we arranged for representatives of NRC, DER and EPA to take measurements (onsite), and soil and water for sampling. On October 31, 1984, the NRC issued a joint report for the agencies which stated that there were no abnormal indications, however, further analyses were underway and would be reported when completed. Approximately

eight months after taking ten samples and more than a month after our reminder, the EPA issued a joint report on February 25, 1985. The NRC director had indicated that the delay in the final report was due to revisions being made to the data by the director of the EPA field office in Middletown, Dr. William Kirk. We requested the original results and an explanation of any "revisions", however a single eport was provided.

We have reason to suspect that the surveillance done by the agencies was not adequate, if honest. We continue to receive reports from a resident where samples were taken who is experiencing health effects similar to those experienced at the time of the accident (see Affidavit 1 of Aamodt Motion, June 21, 194) but not quite as severe. Other persons in this neighborhood are continuing to experience effects that are

of the kind produced by high doses of radiation. For instance, the resident (referenced above) experiences tearing and burning eyes, erythema, the effect of looking through water, and blisters on and in his mouth after working outside on his property. His wife has experienced the same kinds of symptoms, but to a lesser degree; she is not outside as much as her husband. Neighbors have reported persistent and unexplained blisters on their feet; several dogs in the neighborhood also have blisters on their paws. Last fall, four men in total who were in the woods in the same area had to seek emergency treatment for swollen and blistered mouths and throats. Several residents are continuing to experience hair loss, including a young child. The resident, referenced above, and his wife lost all of their body hair by the end of last year. (Unlike previous years since

the accident, these two persons have been engaged in extensive landscaping of their property since last May.) When they spent several months in Florida this past winter, their body hair started to grow back. They showed the new growth to health physicists at the Pa. Bureau of Radiation Protection, who were amazed but who have not been able to provide relief to the residents. Since returning, the residents are again experiencing erythema, tearing eyes and other symptoms.

We believe that these residents are experiencing effects from residual radiation from the TMI-2 accident which has seeped into the soil and is being recycled by the trees and other vegetation. Dandelion leaves, nearly three feet long, were found in this area last fall; garden vegetables were gigantic. (Stimulation is a radiation-effect.) Cucumbers were the

size of mature zuchinni squash, and tomatoes the size of cantelopes. An authority in the field of the effects of ionizing radiation in plants, Dr. James Gunckel, believes that these vegetative effects are due to radiation presently in the environment.

It should be noted that with nearly 2000 different products that occur with uranium fission, the dozen analyses performed by the agencies were fare from complete. All agencies refused to test for ^{129}I on the basis of cost ($150/sample), although this measurement could provide a measure of the total radioiodine released by the accident to a particular area.

The analyses and equipment used by the agencies were unable to detect the radiation people in the TMI area are experiencing. The Commission must be concerned with the dose to these people,

not to the instruments. This matter needs resolution, prior to restart; the problem is not restricted to a family or neighborhood; residents in each of the areas surveyed door-to-door reported similar experiences, notably the recurring rashes which, invariably, they experienced after extensive out-of-door activities.

While the agencies reported the radiation levels measured as not significant, the following statements from the EPA report (2/25/85) are troubling:

> It can be stated with great certainty, however, that the amount of radioiostopes present at the locations are quite ordinary.
>
> Levels of natural isotopes from the uranium series, thorium series and potassium-40 tended to be to the high side of reported values.
>
> The lack of preaccident samples at the same sites precludes making absolute statements regarding the precise relative concentrations of radionuclides present preaccident and now.

> ...at location #2...levels in the front and side yards, which had been graded and topsoil removed, were lower than in parts of the backyard where the original soil remained (4-8uR/hr vs 1-12 uR/hr.)

While the report attributes the above average amounts of radioactivity to naturally occurring isotopes, there are no preaccident samples or other data provided to support this assertion. Further the fact that levels were lower where topsoil had been removed, (by a factor of as much as 2), would cut against the assignment of the above average readings to background. A more reasonable interpretation is that radioactivity in the soil after the accident is twice the pre-accident level. Although the absolute values, even at twice the preaccident levels may appear insignificant, the doubling of the activity of the total soil sample could indicate the presence of minute highly-charged particules. Since the activity being measured is of the type,

alpha, a single minute highly-charged particule whose energy was masked by the volume of the sample could cause the kind of biological damage described by the TMI-are residents if it landed on the skin.

The EPA report dismissed the damage in dogwood trees reported by one resident, and ignore the bulk of information provided about dead pines, pear trees and red maples. The tree damage in the areas where we surveyed, west of TMI, is remarkable. Nearly, if not every, property suffered some tree damage following the TMI accident.

5.0 New Information Concerning TMI-2 Core Temperature

Only recently has the fact thatt the core of Unit 2 reached a temperature in excess of 5000 degrees been made public information. This information was not

considered in the restart proceeding, although it is exceedingly important relative to planning for protection of the public, in the event of a repeat performance of the TMI-2 accident and in the interpretation of health effects experienced since the accident.

The 5100 degree temperature of the core caused elevated levels of fission products and transuranics, melted the zirconium cladding of the core, allowing absorption by water vapor of transuranics with subsequent escape of these materials during venting and leakage to the environment.

Transuranics emit a type of radiation (alpha) which was not considered ruing the radiation measurements and does assessments of the accident. However, a single particle, too minute to be visible and only detectable at close range with special equipment, is extremely hazardous

when inhaled or ingested. Little i known about the specific biological effects of transuranics, however alpha radiation, in general, causes more severe cell damage than equal doses of either gamma of neutron activity. See Exhibit 4 attached. Thus, the most-often cited reference data for biological effects from radiation (Hiroshima, Nagasaki data) where the primary exposure was to gamma and neutron activity, cannot be used as the absolute standard for interpreting TMI-related health effects.

There is a high probability that transuranic materials escaped into the environment. GPU cannot account for between 6,000 and 22,000 pounds of core material. See Exhibit 5 attached. The assumption that this material is trapped within the reactor is not too credible. When Unit 2 filters were analyzed in 1980, transuranics were found in the filters.

See Exhibit 6 attached. Considering the saturated and deteriorated condition of the filters at the time of the accident and the limitations of filters,[10] it is not unreasonable to postulate that transuranics went beyond the filter. Other escape routes have been identified, and more, unidentified, probably existed.

Obviously, GPU and the NRC knew in 1980 that the core temperature had exceeded 5000 degrees and that the accident had been far more serious than they were admitting. They also know, from the presence of transuranics in the filters, that these lethal products could be in the environment, however, they failed to act to protect public health and safety.

[10] Deitz, "Effects of Weathering on Impregnated Charcoal Performance", NRL Memorandum Report 4006, NUREG/CR-0771, May 10, 1979

6.0 The New Information Meets the Standards for Reopening the Hearing

The new information presented in this motion, by itself, meets the tripartite test of NRC rules for reopening a hearing. The information is (1) significant, (2) safety-related, and (3) would have caused the Board to have ruled differently.

the contentions, listed in Section 7.0, need to be considered prior to restart of Unit 1.

7.0 Contentions

1. The recommendations for protective actions for the public and emergency workers are inadequate in view of the severity of the accident and release of transuranic materials.

2. Emergency planning for the 10 mile

radius of TMI is not responsive to the apparent severe radiological impact from the TMI accident beyond the 10 mile radius.

3. The public information pamphlet does not alert the public to the unique hazard from alpha particulates.

4. The agricultural information booklet, which specifically diminishes the risk of contamination from alpha particulates, does not provide the information or means farmers would need to protect themselves from alpha radiation.

5. Dosimetry available to measure radiation in the environment would not detect alpha-emitting products released to the environment.

6. The public cannot depend on the competent and honest regulation of Unit 1 by the NRC Staff.

7. The public whose health has been impacted by the TMI-2 accident cannot

safely bear the additional radiological burden of ALARA[11] releases from the routine operation of Unit 1 as well as the potential of additional severe exposure from incidents and accidents at Unit 1.

8. Present GPU management has demonstrated an improper attitude in paying-off personal injury claimants to silence them.

8.0 Discussion

It is our view that the investigation of the TMI accident is about to being. Whether the NRC will provide the forum, or the outside courts will do so, is a decision that the Commission will make in the coming weeks.

The public has reason to dispair about the administration of nuclear power

[11] As Low As Reasonable Achievable

by the NRC. Is is uncritical enthusiasm which has allowed unsubstantiated conclusions concerning radiological dose to the public to parade as scientific conclusions? The Commission accepted the dose assessment of the Ad Hoc Committee, in rejecting our first motion for a health study, although an independent reviewer had reported the conclusions of this committee were unsubstantiated.[12]

For the first time, we fully appreciate the concerns expressed by Dr. Gordon MacLeod, director of the Pennsylvania Department of Health at the time of the accident, when he questioned if the decision concerning the protective actions for the public should be made by nuclear physicists. MacLeod wrote:

[12] Beyea, "A review of Dose ASsessments at Three Mile Island and Recommendations for Future Research," August 15, 1985, A29-43.

> It seemed that noone outside of professional health circles could appreciate the potential for health hazards of the TMI accident unless they saw people being carried off to hospitals vomiting from radiation sicknesss...That's the attitude that seemed to reign among nuclear engineers and radiation health physicists throughout the accident. Some of those who protested most vehemently against the recommendation that women and children leave the area were among our own ranks within state government -- not the health department ranks -- but radiation health physicists and engineers dealing with the technical aspects of the accident.[13]

"Some Public Health Lessons From Three

13 The Commonwealth's nuclear engineer replied, when asked if he believed that the plant was stable after he learned about the high radiation levels, "Yeah, I guess so" NUREG-0760,103-4, pp. 14. A Commonwealth health physicist testified in the restart proceeding that the Bureau of Radiation Protection is in the "business of public health...what impacts most people" and does not take unique exposures, such as the farming family into account. Tr. 18,225.

Mile Island", Gordon, K. MacLeod, M.D., presented in Stockholm, Sweden, March 11, 1980.

MacLeod's early call for the evacuation of mothers and children went unheeded due to the opposition of the Commonwealth's radiation physicists and nuclear engineers.[14] Absent a consideration of the health effects in residents, the commonwealth and the NRC will allow the nuclear physicists and health physicists to again make inadequate decisions for the public in the event of another accident.

Although the restart of Unit 1 has been an open issue for over six years, the Commission cannot cave-in to pressure from special interests to restart Unit 1. The evidence presented in the Aamodt Motion of

14 Bulletin, Allegheny County Medical Society, April 26, 1980, Vol. 69, No.8, pp. 157.

January 15, 1985 and in the present motion should alert the Commission to the fact that the most important issue -- the health of people impacted by the Unit 2 accident -- is at stake. The Commission must tarry until the matter of the extent of damage, already caused by the TMI-2 accident, has been assessed. A little more exposure to radiation may be too much for an elderly person, a little child, or a pregnant Amish woman. The Commission's decision will be a matter of life or death for a presently unknown number of persons who live in the path winds from TMI travel.

9.0 Conclusions

If the Commission should allow the restart of Unit 1 prior to a full investigation of health effects in the TMI area, the people of central Pennsylvania

should call for the resignation of all consenting Commissioners. Unless the Commissioners heed the public's outcry concerning health problems by deferring its decision on restart of Unit 1 until this matter is fully understood, the Commission will face a public challenge of its own integrity. The Commissioners are, in fact, engaging in criminal neglect of their duty in continuing to ignore their responsibility for the public's health and safety in the face of the clear evidence provided in the Aamodt Motions of June 21, 1984, January 15, 1985 and this amendment.

Respectfully submitted,

_____
Norman O. Aamodt

_____
Marjorie M. Aamodt

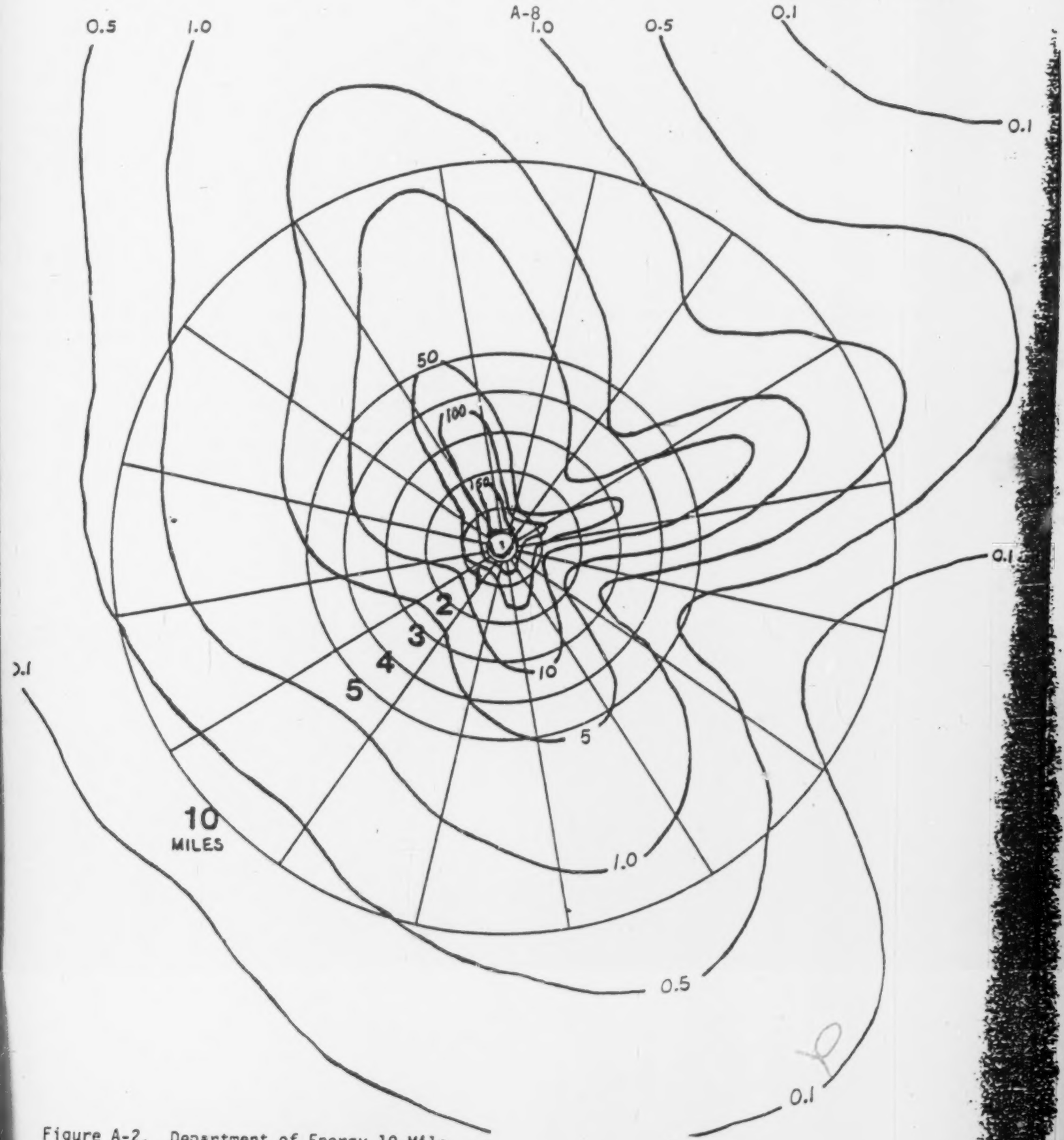
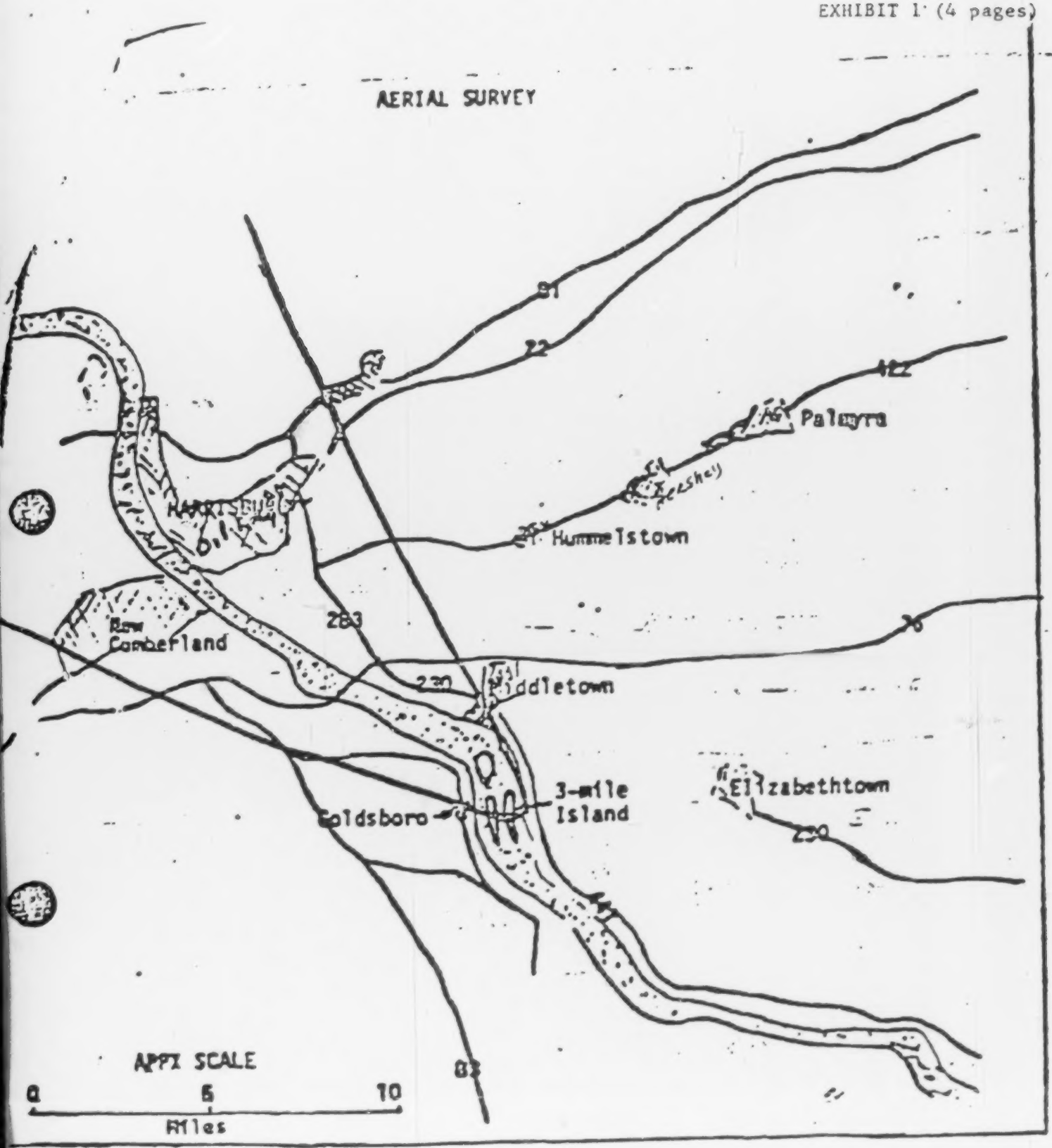


Figure A-2. Department of Energy 10-Mile Exposure Profile (mR) for the Period March 28 through April 3, 1979.

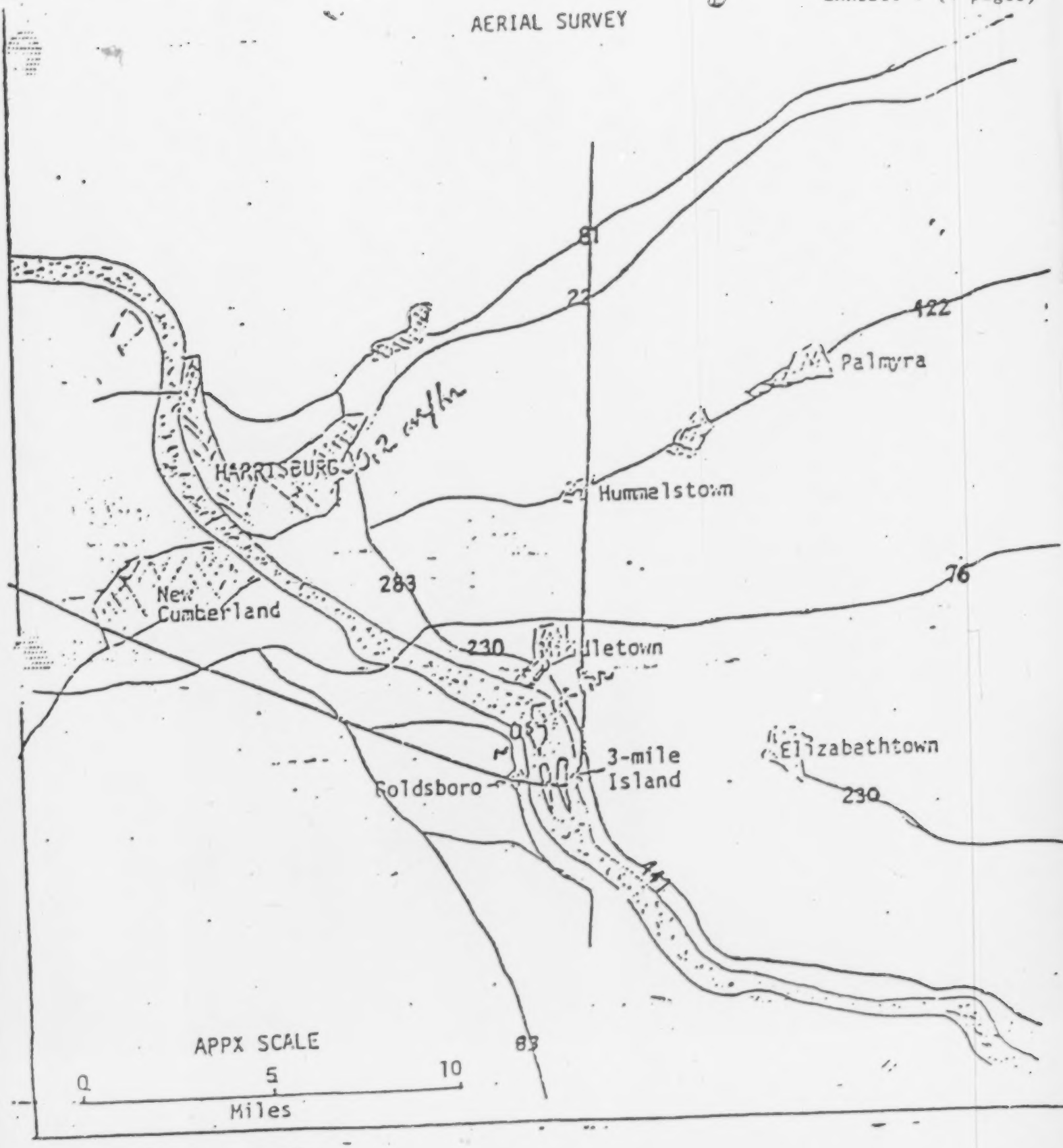
Note: See discussion on instrument calibration on page A-5



ch 28, 1979 8:00 p.m.

Plume in a N to NW direction. Primarily Xe-133. Over Harrisburg, radiation measurements in the plume showed about 0.1 mr/hr. At 10 miles from the site, the plume was about 4-5 miles wide; top of plume at about 3000 feet.

AERIAL SURVEY

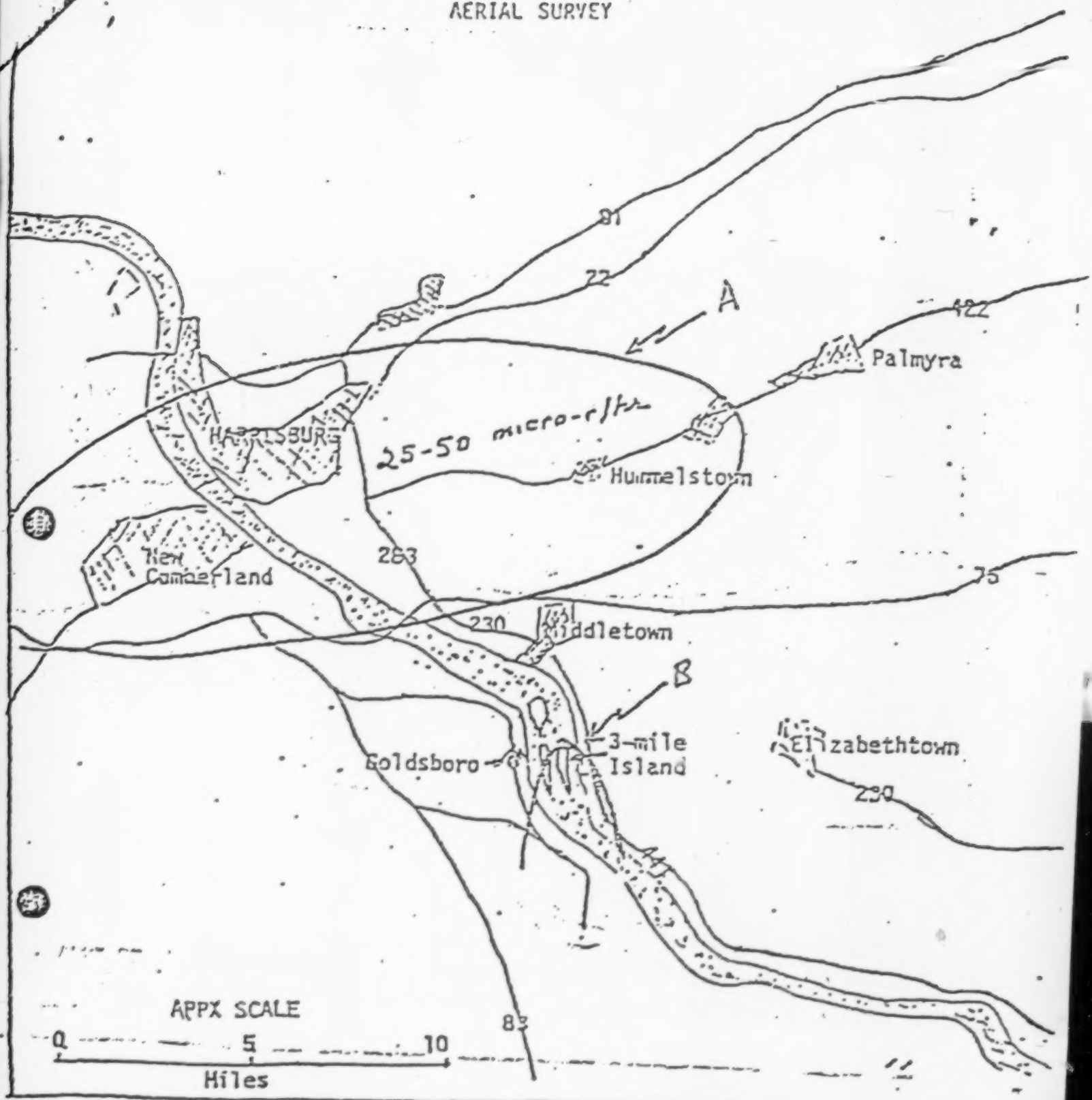


March 29, 1979 10:15 a.m.

Plume in a N to NW direction. Primarily Xe-133. Radiation measurements in the plume at about 10 miles from plant in centerline of plume were 0.2 mr/hr; at 1 mile from plant, about 0.5 mr/hr maximum.

EXHIBIT 1 (4 pages)

AERIAL SURVEY



March 29, 1979 5:00 p.m.

A Residual cloud (Xe-133) N to NW between Mechanicsburg and Hershey, Pennsylvania. Radiation measurements in the cloud in the microroentgen/hour range, highest readings in cloud center.

B Ground level measurements on the island indicated a plume in the southerly direction. Radiation measurements at fenceline south of plant were 10 mr/hr, and one-half mile south of fenceline, 0.5 mr/hr.

17 County Youths to Get $181,700 In Settlement over TMI Accident

LANCASTER, PA., NEW ERA— WEDNESDAY, MARCH 6, 1985

17 Here Will Share Settlement Over TMI Accident

(Continued from Page One)

to 5-year-old Bradley R. Bake, Harrisburg, who was born with Down's syndrome a little more than nine months after the accident.

The other Lancaster County children receiving $10,000 each are:

• Nathan Bare, 11, and Natalie Bare, 9, children of Terry Bare, Columbia.

• Michael Halterman Jr., 16, and Paul Halterman, 14, sons of Michael Halterman, Mount Joy.

• Joseph Geltz Jr., 9, son of Joseph and Marylou Geltz, Columbia.

• Ruth Hoover, 16, Joy Hoover, 15, and Lamar Hoover, 14, Columbia.

• Gina Metzgar, 16, daughter of Lewis and Sally Metzgar, Mount Joy.

• John T. Melson, 17, and Melissa Melson, 15, children of Sharon Wettrau, Columbia.

Sixty-two people, including some of those receiving settlements, filed suit in 1981, alleging they probably came in contact with radioactive debris dispersed over a large area during the accident.

At least one group opposed to the restart of TMI accused the plant's owners of making the out-of-court settlements in an attempt to downplay the health issue.

"In spite of the fact that out-of-court settlements are common, this is not a common issue," said Frances Skolnick of Lancaster, a member of the Susquehanna Valley Alliance.

"Genetic and physical damage to children and adults has occurred. GPU has been willing to pay behind the scenes and at a time when the (Norman and Marjorie) Aamodts have been pressing the NRC to investigate issues in their study which showed a higher incidence of cancer in the Three Mile Island area."

"We feel that GPU settled out of court behind closed doors because it did not want to life the lid off of Pandora's box."

by AD CRABLE
New Era Staff Writer

Seventeen Lancaster County children, who, most of their parents say, suffered nightmares and emotional stress because of the Three Mile Island nuclear accident, are among 68 youths sharing a $3.3 million out-of-court settlement with TMI insurance companies.

The 17 local children will receive $181,700 from the settlement.

The settlements represent the bulk of personal injury cases stemming from the 1979 accident, said Lee Swartz, one of the attorneys for the youths.

The cash award agreements were approved in January and February by Dauphin County Court Judge William W. Lipsitt. The money will be paid by insurance companies for the defendants: General Public Utilities Corp., the owner of the plant, and Metropolitan Edison Co., the GPU subsidiary operating the plant at the time of the accident.

While the lawsuits claimed the accident caused birth defects and emotional distress, TMI officials and the insurance companies stressed the settlements do not mean an admission of responsibility or that the claims were true.

"The insurance companies decided to settle," Phillip R. Clark Sr., president of GPU Nuclear Corp., said in Lancaster Tuesday. "It did not represent a decision by GPU."

The settlements say the children did not suffer any 'provable' injuries.

Clark said the insurance companies weighed the cost of the settlements against the expense of going to trial. The settlements are not an admission of guilt, he said.

The settlements say the children did not suffer any "provable" injuries from radiation exposure or any emotional injuries requiring medical treatment caused by the accident.

The attorneys for the youths and their parents were bound not to comment on the cases, as part of the settlement agreement.

Richard V. Ropka Sr., Baindridge, said the accident caused emotional stress in his grandchildren, Elizabeth Ropka, 17, Thomas Ropka, 12, and Richard Ropka, 6, each of whom received $10,000 in the settlement.

"The children were very upset about it (the accident) at the time," he said. The children's mother, Connie Ropka, Baindridge, declined to discuss the circumstances.

Marchillo Sardi, Columbia R3, said his two children, Marco Sardi, 14, and Edrige Sardi, 14, developed stress because of the accident. The children developed "a lot of nightmares," he said. Each of the children received $10,000.

Receiving $21,700 in the settlement is Amy Shoop, 6, daughter of Edward and Sydney Shoop, Baindridge.

The largest award of the 68 settlements: $1,093,000 — went

—See 17—Page 2

EXHIBIT 2 (2 pages)

(emphasis added)

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EXHIBIT 2 (2 pages)

(emphasis added)

ge OKs $3.9 million for TMI suits

ng

By MARY WARNER
Staff Writer

A Dauphin County Court judge has approved more than $3.9 million in settlements of injury claims resulting from the 1979 accident at Three Mile Island.

The largest — in a claim filed for a Down's syndrome child — was for $1,095,000.

The settlements, all reached out of court, had to be approved by a judge because they involved claims on behalf of children or of the estates of adults who have died since the accident.

A statement issued yesterday by the insurance companies representing the nuclear plant's operators indicated the claims were being settled without regard to the evidence, strictly to avoid the expense of trials.

"These settlements represent an economic decision arrived at by the insurance companies and do not constitute an admission of liability by the companies involved, General Public Utilities Corp. and Metropolitan Edison Co.," the statement said.

"In exchange for payments to the claimants by the insurance companies, all of the defendants in the settled cases are being given general releases from claims of liability."

It could not be learned how much money was involved in the settlements that did not require court approval. Plaintiffs and defendants have agreed not to discuss the settlements, the statement said.

In all, the statement said, "the great majority of 300 personal injury claims" were being settled out of court.

Doug Bedell, a spokesman for TMI operator GPU Nuclear Corp., released the statement. He had no other comment.

The settlements approved by Judge William W. Lipsitt closed claims by 70 children and three estates.

A group of 19 settlements approved yesterday included $855,000 for Gabriella Elsen of Harrisburg, an infant born since the accident who suffered cerebral palsy, and $1,095,000 for 5-year-old Bradley R. Baker of New Cumberland, a Down's syndrome child.

Court documents said Bradley, born just over nine months after the accident, suffered the disorder, which includes mental retardation.

His parents Blaine and Deborah Baker were among 62 plaintiffs in a 1981 suit that sought damages for injuries allegedly linked to the March 28, 1979, accident at the Londonderry Twp. nuclear plant.

The suit said the plaintiffs "most probably came into physical contact with some radioactive debris," which "was dispersed throughout a large area."

Defendants in the suit were General Public Utilities Corp.; its subsidiaries, Metropolitan Edison Co., Jersey Central Power & Light Co., and Pennsylvania Electric Co.; plant designer Babcock and Wil-

See TMI — Page A8

HARRISBURG, PA., THURSDAY, FEB. 7, 1985 FINAL •

(emphasis added)

A Time For Sharing And Caring

Party Brings Young Friends Back Together

By Roxanne Platt
Extra Staff Writer

MAYTOWN — They used to sit together in the schoolyard — playing games, talking and just spending time with each other.

Seven-year-old Matthew Decker, suffering from the affects of an inoperable, benign brain tumor and the medication that accompanies the treatments, was confined to a wheelchair.

Michelle Turner, a classmate of Matt's at Maytown Elementary School, befriended him. The Maytown girl knew that Matt was ill. He, however, didn't realize that she was suffering from leukemia. While other classmates ran and played during recess, the two of them grew to be close friends.

Last Thursday, Michelle turned eight-years-old and Matt, the son of James and Donna Decker, Mount Joy R2, made a guest appearance to wish her well.

Complete with party hats, a specially-created birthday cake, and oodles of friends, Michelle's party was her second in two days. The previous day, her first grade class at Maytown Elementary held a small celebration for her, too.

The piece de resistance for Michelle this year was a bicycle, given to her by the entire student body of W.I. Beahm Junior High School. The money, which was collected at the recent Lollipop Sale at the school, was donated to a fund for Michelle. The fund is being handled by the Welcome Wagon Club of Mount Joy.

Cheri Dillow, a spokesman for the Welcome Wagon Club, said the group felt that because it was such a special time for Michelle and because the funds for such a gift were beyond her mother's means, it would be nice to use the junior high school student collections to go toward Michelle's dream bicycle.

"They gave it (bike) to her after the party at school," said he mother, Shirley Stoudt, 119 Maplewood Lane, Maytown.

"Gail (Goodhart, a friend of the family) carried Michelle out of the building after school and told her to keep her eyes closed until they got next to the bike.

"When she opened her eyes and saw it," Michelle's mother added, "she jumped on it and took off, riding up and down the street a couple of times before she stopped.

"It's made her very happy and that's what I want, for her to be happy. Every year we go all out because we just don't know."

Michelle is currently undergoing chemotherapy treatments at the Hershey Medical Center, while Matt travels to Philadelphia Children's Hospital for occasional tests and CAT scans.

When Matt and Michelle met in September 1984, he was had been in a diagnostic program with Lancaster-Lebanon Intermediate Unit 13. He remained there until that December when he was placed in an Educable Mentally Retarded (EMR) class at East High Elementary School in Elizabethtown.

EXTRA Photograph by Roxanne Platt

Michelle Turner turned eight last week and one of her friends, Matthew Decker of Mount Joy, showed up as a special guest.

her," said Matt.

"At the time," Miss Stoudt said, "Michelle wasn't going outside at recess t often because her white (blood cell) cou was down. She was allowed but she didn want to. After she met Matt, she wanted sit and play with him."

At the end of last year, Michelle was a mitted to Hershey Medical Center for tre ment.

EXHIBIT 3 (2 pages)

EXTRA

Published every Wednesday by Lancaster Newspapers, Inc. Lancaster, Pa. March 20, 1985

Party Brings Two Together

Continued from Page One

"I didn't even know that they knew each other until I saw a story in the newspaper about her being in the hospital," Mrs. Decker said. "Mrs. (Brenda) Lepley, Matt's former teacher, told me."

In January, Matt and his mother went to Hershey to visit Michelle.

"I went because I wanted to see her," he said. He presented her with a red rose on that visit. "I thought she'd never remember me when I went to the hospital to see her because I got glasses."

"She got him back," Michelle's mother said. "Since he had seen her at school, she got a wig."

Both of the youngsters had lost weight, too. Matt lost 17 pounds; Michelle, 12.

"Everytime I saw her," he said, "she looked different."

Matt and his family made a second trip to see Michelle at the hospital but were surprised to find her room door closed.

"We asked the nurse," Matt recalled, "and she said that Michelle went home."

"We must have passed them on different elevators or something," said Mrs. Decker.

"They've both been through so much," said Miss Stoudt, who feels that their friendship is an important understanding tool.

"Sometimes they're comfortable talking and other times, they just like sitting together. It's good for them to be together."

EXTRA Photograph by Rosanne Platt

Proceeds from a Lollipop Day sale at Beahm Junior High School went toward the purchase of a bicycle for Michelle's birthday.

THE DEPOSITION OF RADIANT ENERGY

When ionizing radiations deposit energy in biological materials, ionizations and excitations occur which are not by any means distributed at random. The events tend to be localized along the tracks of individual ionizing particles, in a pattern dependent upon the type of radiation involved. For example, photons of x rays give rise to fast electrons, particles carrying unit electric charge and having very small mass; neutrons, on the other hand, give rise to recoil protons, particles again carrying unit electric charge but this time the particles have a mass nearly 2000 times greater than that of the electron. Alpha particles ionize directly; since they are helium nuclei they carry two electric charges on a particle four times as heavy as a proton, and therefore almost 8000 times as heavy as an electron.

These various charged particles have very different charge-to-mass ratios, as well as different velocities, and as a result the spatial distribution of the ionizing events they produce will differ markedly. The average separation of primary events along a track of an ionizing particle decreases with increasing charge and mass. The tracks of energetic electrons, produced by the absorption of x-ray photons, will be traced by individual primary events which are well separated in space; hence x rays are usually described as being sparsely ionizing. At the other extreme, α particles (which are slow moving, heavy, and cumbersome by comparison with electrons) give rise to individual ionizing events which occur so close together that they tend to overlap, giving rise to tracks which consist of well delineated columns of ionization. Alpha particles, therefore, are said to be densely ionizing. Neutrons fall between these two extremes, and are consequently referred to as particles of intermediate ionizing density.

LINEAR ENERGY TRANSFER (LET)

The linear energy transfer (LET) is a term introduced by Zirkle, and is the energy transferred per unit length of the track. The unit usually used for this quantity is keV per micron of unit density material. The International Commission of Radiological Units (1962) defined this quantity as follows:

> The linear energy transfer (L) of charged particles in a medium is the quotient of dE/dl, where dE is the average energy locally imparted to the medium by a charged particle of specified energy in traversing a distance of dl.

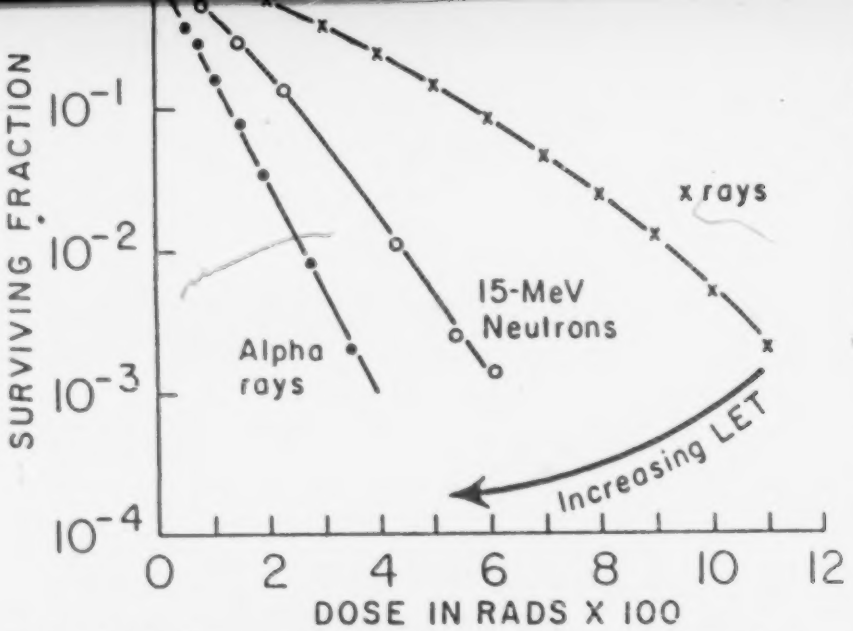


Figure 4-3. Survival curves for cultured cells of human origin exposed to 250-kVp x rays, 15-MeV neutrons, and 4-MeV α particles. As the LET of the radiation increases the slope of the survival curves gets steeper and the size of the initial shoulder gets smaller. (Redrawn from Broerse JJ, Barendsen GW, van Kersen GR: Int J Radiat Biol 13: 559–572, 1967 and Barendsen GW: in Current Topics in Radiation Research. Ebert M, Howard A, Eds. Amsterdam, North-Holland Publishing Co., 1968, Vol 4, pp 293–356.

unity, that is, the shoulder of the curve becomes progressively smaller as the LET increases. A more common way to represent these data is to plot the RBE as a function of LET; this has been done in Figure 4-4. As the LET increases the RBE increases slowly at first, and then more rapidly as the LET increases beyond 10 keV/μ. Between 10 and 100 keV/μ the RBE increases rapidly with increasing LET, and in fact reaches a maximum at about 100 keV/μ; beyond this value for the LET, the RBE again falls to lower values. This is an important effect and needs to be explained in more detail.

THE "OVERKILL" EFFECT

As described in a previous section, the shape of the survival curve for mammalian cells exposed to a sparsely ionizing radiation, such as x rays,

EXHIBIT 4 (3 pages)

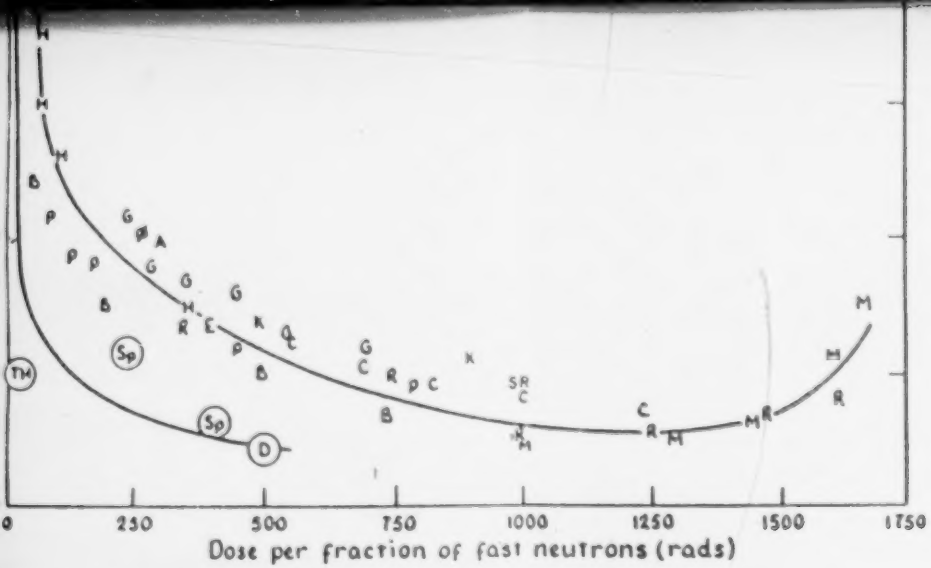


Figure 4-2. RBE for normal tissues irradiated with neutrons from the Hammersmith Cyclotron as a function of dose per fraction of fast neutrons. H: human skin reactions, P: pig skin reactions, G: 4-day gut death in mice, ϕ: leakage of protein from mouse gut, A: leakage of albumin from rat gut, B: stunting of tail growth in rats, K: observation of clones in rat bones, E: survival of chick embryos, R: rat skin reactions, SR: rat skin reactions, M: mouse skin reactions, C: clones in mouse skin, t: weight loss in mouse testes, Y: mouse lymphocytes, TH: weight loss in mouse thymus, Sp: mouse hemopoietic cells, spleen colony assay, D: 30-day death in mice. (From Field SB: Radiol 93: 915, 1969.)

40 2bA

It is important to realize that the RBE of a densely ionizing radiation oes not have a unique value. It may vary due to several factors, in par- icular the size of the dose fraction. This consideration has important mplications in the planning of radiotherapy schedules with new and un- onventional radiation modalities.

RBE AS A FUNCTION OF LET

Figure 4-3 illustrates the survival curves obtained for x rays, for 14-MeV neutrons, and for α particles. As the LET increases from about 2 keV/μ, for x rays, up to 100 keV/μ, for α particles, the survival curve hanges in two important respects. Firstly, the slope of the survival urve *increases*, and secondly the extrapolation number tends towards

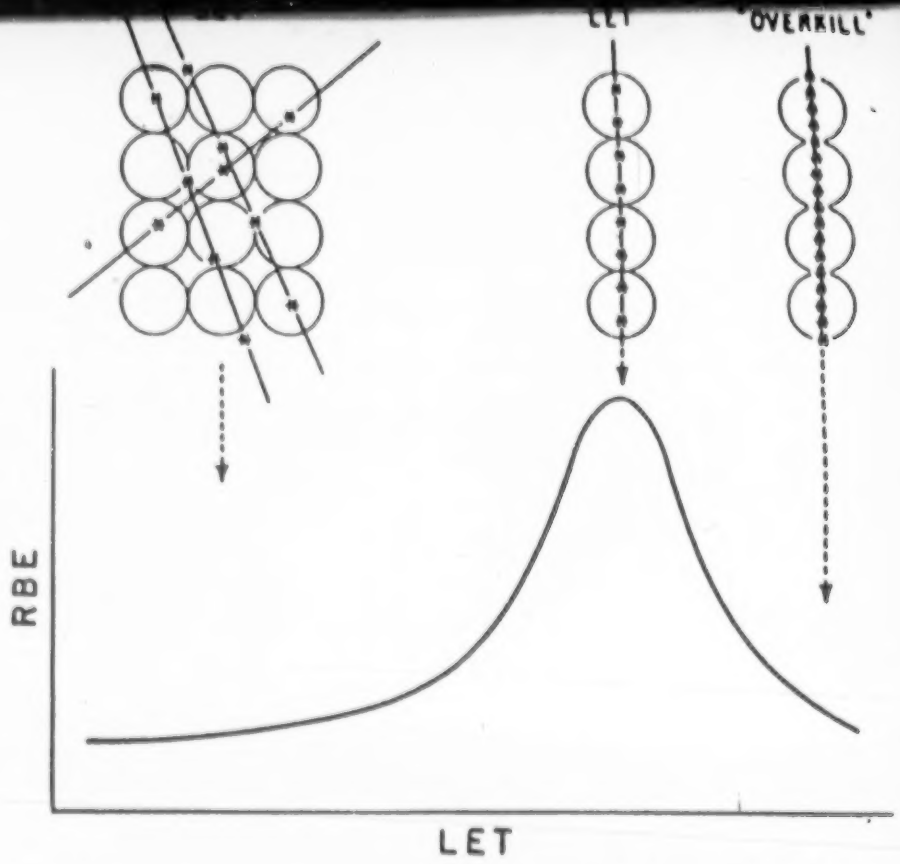


Figure 4-5. Diagrammatic representation of "overkill." For a cell to be killed, energy must be deposited in a number of critical sites within the cell. Sparsely ionizing radiation is inefficient because more than one particle must pass through the cell in order to kill it. Very densely ionizing radiation is also inefficient because it deposits more than enough energy in the critical sites within the cell; energy is wasted, the cells are "overkilled." Radiation of optimum LET deposits just enough energy to inactivate the critical targets.

integrity; but it must be emphasized that the same argument will apply in the general case where there are *n* sites, and there is no information concerning the actual number of sites that must be damaged within the cell. In Figure 4-5, sparsely ionizing radiation, such as x rays, is depicted as being of low LET; the ionizing events are widely separated, and in most cases only one ionizing event will be deposited per cell, which is insufficient to cause that cell to lose its reproductive capacity.

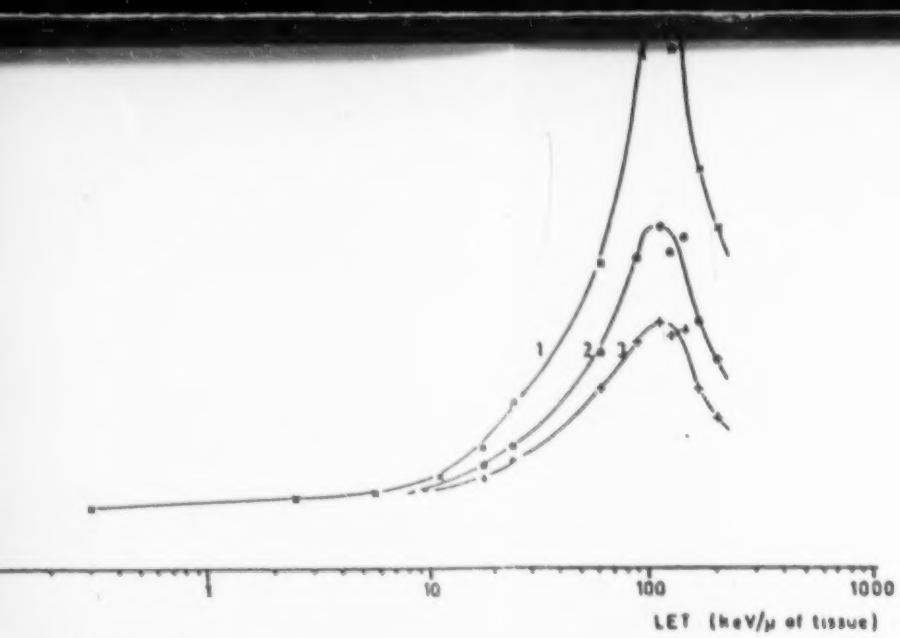
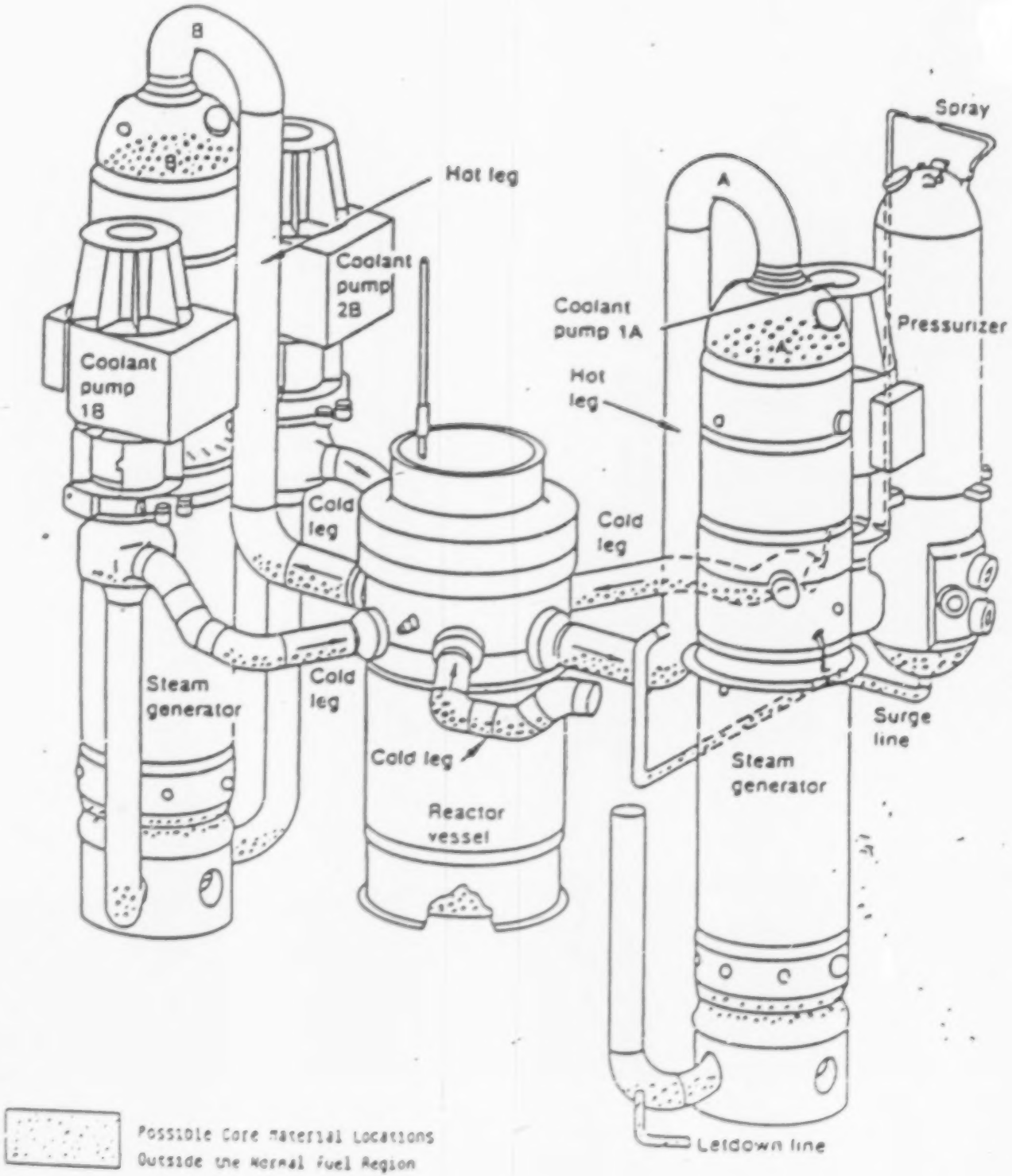


Figure 4-4. The variation of RBE with LET for survival of mammalian cells of human origin. The RBE rises to a maximum at an LET of about 100 keV/μ, and subsequently falls for higher values of LET. Curves 1, 2, and 3 refer to cell survival levels of 0.8, 0.1, and 0.01, respectively, illustrating that the absolute value of the RBE is not unique, but depends on the level of biological damage, and therefore on the dose level. (From Barendsen GW: in Current Topics in Radiation Research. Ebert M, Howard A, Eds. Amsterdam, North-Holland Publishing Co., 1968, Vol 4, pp 293–356.)

strongly indicates that there is more than one target within the cell in which energy must be deposited before the cell will lose its reproductive integrity. In the case of x or γ rays, ionizing events along the tracks of charged particles are separated by relatively long intervals, and indeed it is for this reason that they are described as sparsely ionizing. On average, the spacing between ionizing events is such that it is extremely unlikely that more than one such event will occur within the sensitive target volume of the cell due to the passage of a single electron generated by an x-ray photon. In general, for a cell to be killed by sparsely ionizing radiations, events must occur within the cell from more than one electron passing through it.

In Figure 4-5, cells are depicted as having two sensitive sites in which energy must be deposited in order for the cell to lose its reproductive



Location of Core Material

Location	Percent	Pounds (260,000 TOTAL)
Core Region	84-92	235,000-257,000
Reactor Vessel Bottom	6-14	17,000-39,000
Outside Reactor Vessel	2-8	6,000-22,000

FIGURE 15

We believe about two-thirds of that is at the bottom of the reactor vessel, probably as granular material as we see on top of the fubble bed at the present time. The balance is in the primary system, probably mostly in the seam and generators and most parts of the primary piping.

After fuel removal from the core region is completed, that's about a year after we start next July, there'll be partial disassembly of the core support structure. This will permit access with a vacuum system into the outboard and lower sections of the core support structure; the lower reactor vessel had to remove the fuel particles accumulated in those locations.

We're still investigating methods for removing fuel from the balance of the reactor core system. Several approaches

have been considered, including local vacuuming and flushing back into the reactor vessel itself, where vacuuming could be accomplished there.

We expect to full about 250 fuel cannisters in this process. We now have in effect the contract between GPU Nuclear and the Department of Energy for them to take these fuel cannisters, take custody of them at the TMI-2 site, ship them in a caste which they are currently procuring to the Idaho DOL site for long-term storage.

CHAIRMAN PALLADINO: Have these cannisters been designed and constructed? We're currently determining how much fuel was transmitted from the core region and deposited in other parts of the system as show in Figure 15. There's a small table at the bottom of that figure that is our best estimate of the amount of material that is in the three locations: the core

region, the bottom of the reactor vessel and the primary systems outside the reactor vessel. We now estimate that between 8 percent and 16 percent on a weight basis of the fuel was transported from the core region.

Remember Ed mentioned a quick look indicated that about 30 percent of the volume was missing, but we found compaction below that, so on a weight basis, it's somewhere between 8 and 15 percent that is no longer in the core region.

(brackets added)

EXHIBIT 6

Accident without an end

The plutonium incident

The job moved smoothly, at first.

It was early morning, April 15, 1980, and workers inside the fuel-handling building were transferring a highly contaminated filter into a shipping cask.

The workers had taken the filter from the plant's purification system — which removes radioactive-fission products from the reactor's cooling system — and had placed it in a special canister. It was the first time that such a filter had been removed since the accident.

A crane was used to hoist the canister to the top of the shipping cask, which was 6 feet tall and 6 feet in diameter. The canister had a trap door at the bottom. The plan was to open the trap door, allowing the filter to simply slide into the shipping cask.

But according to NRC records and interviews with workers, the operation hit a snag. "When the door was pulled open, the filter did not drop all the way out, and it was jammed," Mike Williams, a health physics foreman, said during an interview.

The filter, coated with radioactive sludge, was left dangling from the bottom of the canister. Eventually, the workers were able to force the filter to drop. But in the process radioactive particles were jarred loose, and they spread through the air.

Within minutes, radiation alarms sounded and contamination was detected on a worker. The building was evacuated.

By the time the night was through, six more workers would be contaminated.

George Houtz, a health-physics technician who took part in the operation, said during an interview, "To make a long story short, I guess it just got away from us."

What Houtz and the other workers did not know at the time was that the filter they were transporting was contaminated by radioactive plutonium, which had escaped from the reactor core during the accident. Plutonium, a product of nuclear fission, is one of the deadliest substances on earth.

They would not learn of the plutonium for more than a year.

It was not until April 1981, after another spread of contamination, that an investigation of the 1980 incident was begun. That investigation concluded in May 1981 that two workers — Houtz and Williams — had inhaled plutonium particles.

Scientists say inhaling even tiny amounts of plutonium may cause cancer of the lungs, liver, bones or the lymphatic system.

An internal company report documents that the company's initial review of the contamination incident did not consider the possibility that the workers might have been exposed to plutonium.

No tests were done to determine the presence of plutonium particles or other fission products that give off a type of radiation called alpha. Substances that give off alpha particles can be deadly if inhaled.

The company report shows that none of the workers underwent fecal analysis, a test used to determine whether radioactive particles have become lodged inside the body.

Consequently, nobody knows exactly how much plutonium Houtz and Williams inhaled.

Hildebrand, who conducted the investigation and wrote the company report on the contamination incident, said neither Houtz nor Williams was wearing a respirator or protective clothing on the job because no one had anticipated that there would be a spread of contamination during the filter transfer.

His report concluded that radiological controls on the job had been poor, that all the workers should have worn respirators and that Houtz and Williams should have undergone fecal analyses to test for internal contamination.

Hildebrand also concluded that the utility had waited too long to investigate the incident, since a June 1980 analysis of a sample taken from the filter had "clearly indicated the presence" of plutonium along with uranium, americium and other materials that give off alpha radiation.

Hildebrand concluded, however, that the amount of plutonium inhaled by Houtz and Williams was a minute fraction of the allowable limits set by the NRC. He said during an interview that the incident was "not significant."

During interviews, Johnson and Gofman said the incident did not appear insignificant at all.

"Plutonium is the most hazardous substance of commercial importance known to man," said Johnson, who has studied health problems among people who were exposed to plutonium and other radioactive materials near the Rocky Flats weapons plant in Colorado. "There definitely is a risk to the workers."

And Gofman, former associate director of the Lawrence Livermore Laboratory, said workers could develop cancer even if they inhaled far less plutonium than the federal government allowed.

Gofman said it was impossible to say there were no health risks because no one really knew how much plutonium the workers had been exposed to.

TMI-AREA RESIDENTS'S RELATING OF EXPERIENCES ON FRIDAY, MARCH 30TH, 1979

This is being recorded on March 19, 1985. Since I cannot be with you in person, perhaps this tape will suffice. This is my own personal report of the events that occurred directly to our family following the accident at Three Mile Island on March 28, 1979.

On Wednesday, there were news reports on radio and television of an accident at Three Mile Island. Many of the reports were conflicting, so that the public was unsure as to what really had happened.

There was talk of evacuation, and where people were to go. First, it was a day of confusion. No one really had any idea of what recourse should be taken to ensure their lives and property.

On Friday evening, it was very windy

and the rain was falling steadily here at our farm. Our cat had to go out to relieve himself, and when he didn't'nt come back to the windowsill in a reasonable length of time, I became worried, for I could hear him yelling in a very strange fashion. His meowing was more of a howl than a meow. Thinking that he would come as soon as I opened the front door, I did not bother to put on a coat, but only put a scarf over my head, since I had just brushed my hair. So, I went out to the front porch, standing back against the wall of the house and called and called to him.

He kept on howling. So, I went over to the banister, leaned over, and called him again. The wind had been blowing steadily from the north to the south, when suddenly there was a moment of intense stillness.

The wind stopped abruptly, and a wave

of heat engulfed me, bringing the rain then all over me. It happened so quickly that it startled me, and made such an impression on my mind that to this day I still relive over and over those few minutes. I cannot get away from them.

The cat finally came. I bent down to wipe the rain from his coat, and we both went in, and was thoroughly disgusted when I felt my own hair, which had become soaked about half way back because the wind had blown my scarf nearly off. Then I did a really dumb thing. I washed my face and hands with soap and water, and only dried the rain from my arms and neck and shoulders and legs with a towel, not using any soap and water.

About an hour later my skin, including the skin on my face and arms, had become pink and very prickly. I excused myself from the table in the living room, went to the bathroom and

scrubbed all of the exposed areas with soap and warm water. Then I applied a lotion to those parts that had been uncovered.

Before I went to the bathroom, a neighbor had come to the door asking my husband to help spread the word that there was real trouble at TMI, and gave him a handful of papers with evacuation directions on them, and would he please distribute them to the people living on beyond our properly, so he and our daughter left to do that immediately.

On Saturday, my skin was a darker shade of red and extremely irritated, and the front part of my body was itchy to the point where I had to scratch almost constantly.

On Sunday morning, several people at church asked me where I had gotten my sunburn. My face, arms, neck, and legs were quite red, and small , hard bumps had

come out on my forehead, and up in the front half of my scalp.

On Tuesday, I washed my hair again, using three applications of shampoo instead of the usual two. The itch was awful.

About three weeks later, my -- white hairs appeared all through the front of my hair, and the tops of my eyebrows were white. the hair came out in my comb in unbelievable amounts. I could now see my scalp through the thin hair on the front half of my head.

I made an appointment with the person who gave me my permanent, and he in turn gave my head some special treatments. Eventually, the hair loss stopped, and several weeks later new growth appeared.

The hair on my forearms was always flat to my skin, but now appear to be growing in all directions. When Dr. Kirk came to my house to interview me, I showed

him this erractic growth on my arms. It is still growing in the same manner. My throat is no longer sore on the inside, but some of the ugly discolored skin remains on the outside.

To this day, almost six years after TMI, I am not well. I have lost my left kidney completely. It just dried up and disappeared with no medical explanation whatever. And my case was presented by my kidney specialist to a symposium of doctors at the Hershey Medical School. None of them had ever had a case like mine, nor do they have an explanation of such an unusual happening.

Also, our eldest granddaughter has been hospitalized on two occasions for abdominal problems. She and her sister visited us for the three summers following TMI, and spent much of their playtime on that same front porch. There was no record of any similar abdominal problems

on either side of her family tree. We can only hope and pray that both she and her sister, and the other three grandchildren will remain healthy, for they have all played on that same porch.

All I want to point out by this is that we did not even think of possible contamination still remaining there. We are just ordinary people without any scientific knowledge concerning radiation, et cetera.

To this day, March 19, 1985, the discoloration is still visible on my arms and neck. Red spots still appear on my face, arms, legs, breasts, shoulder, abdomen, with alarming regularity.

I can assure you that TMI is an ever-present fear in my life because of physical evidence. It is something that I see daily. The traumatic fear within me cannot be seen by anyone, nor felt by anyone else. It is there constantly in my

mind.

You cannot possibly know what happens inside me when the siren is tested, or when for unknown reasons it suddenly sounds. I was one of the people interviewed by ABC Television Network for an upcoming documentary program on TMI. Never have I been treated with more respect and understanding than given to me by the persons who came into our home. They were kind and considerate, and very caring, as I hope you will be also.

Thank you for listening to my sad tale, all of which I will gladly swear to on an open bible. Thank you so very much for your time.

200 North Church Street (Oak
Parkesburg, Pennsylvania 1936
April 22, 1985

To the Commissioners, Boards and Parties:

In order to avoid a possible misinterpretation of the taperecordings of the experiences of a TMI-area resident sent to the Commission or the transcript of the recording sent to the Boards and parties, additional information is needed.

Although this persons described the direction of the prevailing wind (and rain) as from north to south (pp. 2 of the transcript), the direction of the "wave of heat" was not distinguished as being from a different direction, although that had been my recollection from an initial interview on May 11, 1984 and subsequently on August 30, 1984. In fact, I specifically recalled that the resident

had pointed out a cherry tree at the southeast corner of the porch as being in the direction from which the "wave of heat" had traveled. Representatives of NRC, DER-PA and EPA were present on August 30, 1984 when the direction of the "wave" from the southeast was described.

Since the direction of the "wave of heat", which we believe was a radioactive plume from TMI, was not identified on the taperecording (or transcript), I decided to substantiate this importnat point by speaking again with the resident. Therefore, I called her this evening and directly asked her to describe the direction of travel of the "wave of heat" she had described on the taperecording. She unhesitatingly responded that the direction was from the southeast (in contrast to the direction of the rain and wind immediately prior to and after the "wave of heat".)

The difference in the direction of the wave of heat from the prevailing wind suggests that there was release from TMI on the evening of March 30, 1979 that was of sufficient energy to momentarily change the wind patterns in the area.

Respectfully submitted

Marjorie M. Aamodt

CRITIQUE OF CENTER FOR DISEASE CONTROL (CDC) RESPONSE TO AAMODT STUDY

by

Norman O. Aamodt

The CDC letter contained 23 criticism of the Aamodt data and related analysis. Each criticism is considered in the order given.[1]

1. CDC asserts that the areas listed are "out of the highest exposed areas", citing as support the "May 10, 1979 preliminary dose assessment report." This position is flawed on two counts: A principle purpose of the Aamodt motion was to challenge this and similar dose assessments, noting that radiation release records from TMI-2 are missing for the early hours of the accident, that wind patterns were such that these releases

[1] See Attachment 1 - The CDC letter, Caldwell to Mills, September 7, 1984.

would have passed over the study area and that the observed effects tended to support their position. CDC demonstrates an objective attitude by attempting to discredit the data by inferring that it simply was not possible.

2. The individual of Affidavit 2 consulted a physician and was told that his symptoms (the symptoms listed both in the body of the motion and in the attached affidavits) were typical of those expected from severe radiation exposure but could not have been since no significant amount of radiation escaped during the accident! Further, any reasonably well-read member of this society can recognize the observed symptoms as similar to those resulting from severe radiation exposure. It is, therefore, suggestive of extreme bias that Dr. Caldwell, a medical doctor, did not.

3. Yes. Individuals from all of thes agencies as well as Dr. George Tokuhata of

the Pennsylvania Department of Health and Governor Richard Thornburg (Pennsylvania) were asked to consider them to no avail.

4. Any bias from interviewers may have had was overcome by the use of a survey questionnaire and specific instructions to each interviewer regarding its use. Then, the person interviewed was asked to look over the form to be certain that it fairly reflected the information provided and to sign it.

5. This information, gathered outside the study area, was clearly identified and not included in the data analysis, i.e. cancer mortality rate.

6. The lump appeared after the accident. The afflicted person had not sought medical attention by the time of the survey.

7. This finding results from a calculation of the ratio of the number of reported (and confirmed) cancer deaths in

the study population to the number of cancer deaths predicted by the Pennsylvania Vital Statistics. Since the cancer mortality rate in York County and rural areas, in general, is lower than the state average, a most conservative cancer mortality rate was derived.

The data is clearly presented in the Aamodt motion. The fact that cancers may have been present before TMI is irrelevant. Three cancer deaths were expected. To excise any of these because of earlier diagnosis would have been in error.

8. This is in progress. The appropriateness of medical review in no way denigrates the validity of first-hand accounts of personal experiences or descriptions of persoan physicians' diagnoses.

9. Had CDC read the motion carefully, it would have ben clear to them that this

ws precisely the Aamodts' position. The Aamodts used first-hand accounts to infer hypotheses which, in their motion, they requested the Commission to test.

10. a. CDC does not specify the area in which they allege the data is incomplete. It is true that some residents could not be contacted. It is also true that some persons may, for various reasons, have been unwilling to acknowledge that they had cancer. Both of these aspects of "incompleteness" would only cause the calculated cancer mortality rate to be higher, adding an element of conservatism to the study. Death certificates have been obtained for 13(?) and in all cases the listed immediate cause of death was cancer (after lost of breath). The 20th death certificate is expected shortly. Two other reported cancer deaths were dropped, one because death occurred before 1979 and the other

because cancer was not listed. Two cancer deaths, not having occurred at the time of the survey, were verified and included. The period presently considered in the survey are the years 1980-1984.

b. As set out in Figure 1, the age distribution is such that the median age range is 35-39, identical to the Pennsylvania Vital Statistics. Sex and race adjustment are not ordinarily made in the Pennsylvania Vital Statistics Report on cancer mortality rate. In any event, such adjustments could not be expected to raise the expected rate by anything near the factor of 4 or more needed to make the conclusions of the study invalid.

c. Date of diagnosis may be important in assigning cause. It bears no relevance to computing cancer mortality rate. Further, CDC presents no basis for its assumption that a cancer resulting from exposure from the TMI-2 accident must

necessarily take at least one year to develop. Neither CDC nor anyone else knows precisely what the active agents may have been. To exclude cancers diagnosed prior to the accident from a calculation of cancer mortality rate would be at best capricious.

d. CDC presents no evidence that cancers cannot occur without a "long" latency period. Short latency periods are known to occur. Note the literature on organ transplants and the effected of depressed immune systems. Could the role of a causative agent emitted from TMI have been to suppress the immune system? In any event, eliminating 1979 data, when only one cancer death occurred, only increased the cancer mortality rate.

e. Verification does not exist, as stated (10.a) above.

f. Age distribution coincides with Pennsylvania Vital Statistics. See 10.b

above.

g. This is true. The baseline data used (Pennsylvania Vital Statistics) yields a very conservative result. Rural areas, such as those surveyed, can be expected to have lower cancer mortality rate than the state average. We have obtained data from the Pennsylvania Department of Health providing population and cancer death statistics back to 1970 for the townships in which the survey was made. This data was analyzed[2] and yielded an expected cancer mortality rate of 153.4/100,000 in contrast to the statewide rate of 215.6/100,000. Using the figure of 153.4 and adjusting the survey data to only include the years 1980-1984, the actual present cancer mortality rate in the study is seen to be 7 times the

[2] Appendix A to Aamodt Study, Revision 1

expected rate.

The incidences of the tumors and cancers were mostly post-accident. Nineteen of the 26 tumors/cancers occurred post-accident. These data are believed to be reliable. They are based on interviews with actual afflicted persons and/or close relative. One tumor/cancer is known to be pre-accident. The others need to be checked. Further, number of tumors found can be expected to be conservative because of some victims' reluctance to disclose this kind of information. In several instances, the victim required several follow-up contacts before he/she would admit to and discuss the existence of a tumor. The number of tumors/cancers in living cannot be compared for expectancy to the total population of the survey areas (433) but rather to that for the families contacted (298) because of the reluctance observed. Whereas cancer

deaths were public information, it appeared, and the total population was used to calculate the cancer mortality rate, cancer/tumor diagnosis is a private affair in the areas surveyed around TMI. The Pennsylvania tumor registry could be helpful if it were available.

12. a.There is no definitive data in existence to describe the full spectrum and concentrations of the potential health antagonists that were released from TMI-2. The processes involved in the detonation of a bomb and the normal and abnormal operation of TMI-2 yield vastly different sets of antagonists, so that "Hiroshima" data (which itself is not yet fully understood and did produce a spectrum of short latency period cancers) cannot be used as a model for analysis. The singe isotope exposure data gleaned from medical experience is also of no significant value in determining the effects of

radionuclides appearing in combination with a host of potential co-reactants.

CDC's assertion that the latency period was inadequate to allow the development of observed cancers is unfounded.

b. As discussed in 12.a., this position is fatally flawed absent an an accurate analysis of TMI-2 emissions.

c. The assertion is faulted on two counts. First "radiation alone" cannot be demonstrated to the causative agent. Secondly, there is no basis to assert that "only blasts" can cause a collapsed organ. No evidence was presented to infer that the organs collapsed as a result of physical impact. Rather we find the presence of what appears to be a grossly excessive number of collapsed organs provocative. We would suggest that CDC (and others) take notice of the fact that organs collapse when muscle tissue is

impaired. Radiocesium (and perhaps other materials int the TMI-2 reactor vessel inventory) have an affinity for muscle tissue. To suggest a relationship of organ collapse to the TMI-2 accident is not, at this early stage of investigation, unreasonable. Further, the collapse organ data was included to provide as complete a picture as possible of the current state of health of residents in the study area.

13. Interpretation of the data was not attempted. An attempt to gain access to medical records was beyond the scope of the study but clearly within the scope of the investigation requested of the NRC Commissioners. Diagnoses have now been rediscussed with many of the afflicted individuals, and this data is reflected in Revision 1 to the Aamodt study. None of the reported tumors were mosquito bites. Medical records have been requested.

14. CDC's perception demonstrates

negative bias and is a direct conflict with medical opinion as related by afflicted individuals.

15. CDC does not consider the effect of diminished muscle function. (See 12.4) To ignore this data could be a very serious mistake. Cesarian sections were the most frequently occurring abnormality. This finding was to be expected in light of animal data which suggest a fourfold increase in Cesarian sections on local farms.

16. This assertion that "lack of an adequate, contemporary control group...weakens even the possibility of arriving at a reasonable conclusions" (emphasis added) demonstrates appalling bias. It is also false on three counts:

1. The Pennsylvania Vital Statistics provide a meaningful, conservative control group.

2. CDC is aware of the existence of appropriate township statistics which can accurately describe baseline conditions. In fact, as discussed above, the Aamodts have obtained this data. Calculations using this data further demonstrated the conservative nature of the Aamodt conclusions.

3. CDC possess the expertise to know that any fourfold (let alone 7 fold) departure of cancer mortality rate from state averages cannot be expected to go away by baseline modification and that such a departure is symptomatic of a significant insult to the study population.

17. The Aamodt motion stated the number of tumors in living persons "suggest" a continuing excess cancer mortality. It did not present this suggestion as a conclusion. Further inquiry in this area would result from

approval of the motion by the NRC Commissioners.

18. The assertions that the affidavits are "testimony and opinion" but "not scientific data" is an absurdity which could support a conclusion that the CDC response is fatally flawed by bias. CDC knows full well that the raw statistics derived from surveys provide the base data for innumerable "scientific" studies in numerous disciplines.

19. Unless CDC can present definitive data to support their view (see answers to 10. c. and d.) this assertion can only be viewed as demonstrating bias.

20. Yes. Dr. Gunckel described the thoroughness of his investigation in his affidavit 5.

21. CDC overlooked the Reed letter (Attachment 2 to motion) in characterizing the number of residents reporting errythema and other symptoms as "several".

Reed stated that hundreds of people called him and described similar symptoms. Thousands of people have called the Commonwealth of Pennsylvania concerning their experiences. We are attempting to obtain these records. As Representative Reed asserted, hundreds of people did not imagine similar experiences. CDC also overlooked Affidavit 2, where in the individual stated that he described his symptoms to a doctor the day following his experience and the doctor noted that the symptoms were similar to those expected from radiation exposure. However radiation exposure was ruled out on the basis of the official position that "no radiation got out". The doctor's bias is understandable. CDC's is not. CDC exhibits further bias by assuming other causes for the observed symptoms. CDC should also carefully consider the fact that not <u>one</u> individual has yet been found

that had experience prior to the TMI-2 accident.

22. CDC again exhibits incomprehensible bias, this time by rejecting out of hand the observations of trained professional people. This anecdotal information is not presented as "data". It is provided to assist the reader in grasping the gravity of the problem. In its place, this paragraph is provocative.

23. CDC again exhibits bias in an assertion that it is "unlikely" that an increase in cancer deaths could be expected given the noted health effects. No basis other than bias is given or implied other than to discard out of hand the validity of the observations noted in the study.

A great number of the questions raised by CDC could have been resolved by means of a phone call to the Aamodts. The

fact that CDC made no attempt to follow-up with the Aamodts is a clear demonstration of the cursory nature of their review. The fact that CDC discards the study conclusions out of hand without a single example of solid basis demonstrates severe bias. The fact that CDC concludes with a suggestion for a follow-up study is evidence that CDC does not take its own objections to the Aamodt study seriously. The fact that CDC suggests that this follow-up study be based on a census of their own taking which has been described as useless gives telling evidence that CDC would well be part of a conspiracy to coverup health effects from the accident at TMI-2.

AMENDMENT 14

(Section 1. Citizens of the United States

All persons born or naturalized in the United States, and subject to the jurisdiction thereof, are citizens of the United States and of the State wherein they reside. No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws.

42 Sec. 2239. Hearings and judicial review

(a)(1) In any proceeding under this chapter, for the granting, suspending, revoking, or amending of any license or construction permit, or application to transfer control, and in any proceeding for the issuance or modification of rules and regulations dealing with the activities of licensees, and in any proceeding for the payment of compensation, an award or royalties under sections 2183, 2187 2236(c) or 2238 of this title, the Commission shall grant a hearing upon the request of any person whose interest may be affected by the proceeding, and shall admit any such person as a party to such proceeding. The Commission shall hold a hearing after thirty days' notice and publication once in the Federal Register, on each application under section 2133 or 2134(b) of this title for a construction permit

for a testing facility. In cases where such a construction permit has been issued following the holding of such a hearing, the Commission may, in the absence of a request therefor by any person whose interest may be affected, issue an operating license or an amendment to a construction permit or an amendment to an operating license without a hearing, but upon thirty days' notice and publication once in the Federal Register of its intent to do so. The Commission may dispense with such thirty days' notice and publication with respect to any application for an amendment to a construction permit or an amendment to an operating license upon a determination by the Commission that the amendment involves no significant hazards consideration.

42 Sec. 4331. Congressional declaration of National Environmental Policy

Creation and maintenance of conditions under which man and nature can exist in productive harmony

(a) The Congress, recognizing the profound impact of man's activity on the interrelations of all components of the natural environment, particularly the profound influences of population growth, high-density urbanization, industrial expansion, resource exploitation, and new and expanding technological advances and recognizing further the critical importance of restoring and maintaining environmental quality to the overall welfare and development of man, declares that it is the continuing policy of the Federal Government, in cooperation with State and local governments, and other concerned public and private

organizations, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.

Continuing responsibility of Federal Government to use all practicable means to improve and coordinate Federal plans, functions, programs, and resources

(b) In order to carry out the policy set forth in this chapter, it is the continuing responsibility of the Federal Government to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the

end that the Nation may --

1. fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;

2.assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings;

3.attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;

4.preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity and variety of individual choice;

5.achieve a balance between population and resource use which will permit high standards of living and a wide sharing

of life's amenities; and

6.enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

42 Sec. 4332. Cooperation of agencies; reports; availability of information; recommendations; international and national coordination of efforts

The Congress authorizes and directs that to the fullest extent possible: (1) the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this chapter, and (2) all agencies of the Federal Government shall --

(A) utilize a systematic, interdisciplinary approach which will

insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking which may have an impact on man's environment;

(B) identify and develop methods and procedures, in consultation with the Council on Environmental Quality established by subchapter II of this chapter, which will insure that present unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations;

(C) include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on --

(i) the environmental impact of the proposed action,

(ii) any adverse environmental effect which cannot be avoided should the proposal be implemented,

(iii) alternatives to the proposed action,

(iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and

(v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

Prior to making any detailed statement, the responsible Federal official shall consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved. Copies of such statement and

the comments and views of the appropriate Federal, State, and local agencies, which are authorized to develop and enforce environmental standards, shall be made available to the President, the Council on Environmental Quality and to the public as provided by section 552 of Title 5, and shall accompany the proposal through the existing agency review processes;

(D) Any detailed statement required under subparagraph (C) after January 1, 1970, for any major Federal action funded under a program of grants to States shall not be deemed to be legally insufficient solely by reason of having been prepared by a State agency or official, if:

(i) the State agency or official has statewide jurisdiction and has the responsibility for such action,

(ii) the responsible Federal official furnishes guidance and participates in such preparation,

(iii) the responsible Federal official independently evaluates such statement prior to its approval and adoption, and

(iv) after January 1, 1976, the responsible Federal official provides early notification to, and solicits the view of, any other State or any Federal land management entity of any action or any alternative thereto which may have significant impacts upon such State or affected Federal land management entity and if there is any disagreement on such impacts, prepares a written assessment of such impacts and views for incorporation into such detailed statement.

The procedures in this subparagraph shall not relieve the Federal official of his responsibilities for the scope, objectivity, and content of the entire statement or of any other responsibility

under this chapter; and further, this subparagraph does not affect the legal sufficiency of statements prepared by State agencies with less than statewide jurisdiction.[1]

(E) study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources;

(F) recognize the worldwide and long-range character of environmental problems and, where consistent with the foreign policy of the United States, lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of mankind's world environment;

[1] So in original.

(G) make available to States, counties, municipalities, institutions, and individuals, advice and information useful in restoring, maintaining, and enhancing the quality of the environment;

(H) initiate and utilize ecological information in the planning and development of resource oriented projects; and

(I) assist the Council on Environmental Quality established by subchapter II of this chapter.

Pub. L. 91-190, Title I, Sec. 102, Jan. 1, 1970, 83 Stat. 853; Pub.L. 94-83, Aug. 9, 1975, 89 Stat. 424.

5 USCS Sec. 554. Adjudications

(a) This section applies, according to the provisions thereof, in every case of adjudication required by statute to be determined on the record after opportunity

for an agency hearing, except to the extent that there is involved -

(1) a matter subject to a subsequent trial of the law and the facts de novo in a court;

(2) the selection or tenure of an employee, except a [an] administrative law judge appointed under section 3105 of this title [5 USCS Sec. 3105];

(3) proceedings in which decision rest solely on inspections, tests, or elections;

(4) the conduct of military or foreign affairs functions;

(5) cases in which an agency is acting as an agent for a court; or

(6) the certification of worker representatives.

(b) Persons entitled to notice of an agency hearing shall be timely informed of -

(1) the time, place, and nature of

the hearing;

(2) the legal authority and jurisdiction under which the hearing is to be held; and

(3) the matters of fact and law asserted.

When private persons are the moving parties, other parties to the proceeding shall give prompt notice of issues controverted in fact or law; and in other instances agencies may by rule require responsive pleading. In fixing the time and place for hearings, due regard shall be had for the convenience and necessity of the parties or their representatives.

(c) The agency shall give all interested parties opportunity for -

(1) the submission and consideration of facts, arguments, offers of settlement, or proposals of adjustment when time, the nature of the

proceeding, and the public interest permit; and

(2) to the extent that the parties are unable so to determine a controversy by consent, hearing and decision on notice and in accordance with sections 556 and 557 of this title [5 USCS Secs. 556 and 577].

(d) The employee who presides at the reception of evidence pursuant to section 556 of this title [5 USCS Sec. 556] shall make the recommended decision or initial decision required by section 557 of this title [5 USCS Sec. 557], unless he becomes unavailable to the agency. Except to the extent required for the disposition of ex parte matters as authorized by law, such an employee may not -

(1) consult a person or party on a fact in issue, unless on notice and opportunity for all parties to participate; or

(2) be responsible to or subject to the supervision or direction of an employee or agent engaged in the performance of investigative or prosecuting functions for an agency. An employee or agent engaged in the performance of investigative or prosecuting functions for an agency in a case may not, in th t or a factually related case, participa.e or advise in the decision, recommended decision, or agency review pursuant to section 557 of this title [5 USCS Sec. 557], except as witness or counsel in public proceedings. This subsection does not apply - (A) in determining applications for initial licenses;

(B) to proceedings involving the validity or application of rates, facilities, or practices of public utilities or carriers; or

(C) to the agency or a member or

members of the body comprising the agency.

(e) The agency, with like effect as in the case of other orders, and in its sound discretion, may issue a declaratory order to terminate a controversy or remove uncertainty.

(Sept. 6, 1966, P. L. 89-554, Sec. 1, 80 Stat. 384; Mar. 27, 1978, P. L. 95-215, Sec. 2(a)(1), 92 Stat. 183.)

5 USCS Sec. 704. Actions reviewable

Agency action made reviewable by statute and final agency action for which there is no other adequate remedy in a court are subject to judicial review. A preliminary, procedural, or intermediate agency action or ruling not directly reviewable is subject to review on the review of the final agency action. Except as otherwise expressly required by

statute, agency action otherwise final is final for the purposes of this section whether or not there has been presented or determined an application for a declaratory order, for any form of reconsideration, or, unless the agency otherwise requires by rule and provides that the action meanwhile is inoperative, for an appeal to superior agency authority. (Sept. 6, 1966, P. L. 89-554, Sec. 1, Stat. 392.)